Accounting Goodwill And The Main Constituent Drivers Of Corporate Value : A Review And Empirical Study

Thesis

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TITLE:

Accounting goodwill and the main constituent drivers of corporate value - a review and empirical study

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Submitted By:

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On behalf of:

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Gareth Owen

ABSTRACT:

This thesis begins by exploring the nature and origin of goodwill as an accounting phenomenon, identifying and discussing contributions to this subject and the problems it has posed in accountancy over many years. It also examines how the standard setting bodies of accounting have handled the recognition and measurement of goodwill within financial reports, and then how the whole concept of goodwill fits into accepted economic theory. Having established from the economic perspective that goodwill is in effect a residual measure of value within the accounting arising out of the historical cost and realization principles, the thesis then describes and critically evaluates valuation models that genuinely try and bridge the "value gap" between the accounting and economic models, particularly value-based models such as Residual Income, Economic Value Added, EVA© and Shareholder Value Added (SVA).

The thesis then focuses on the free cash flow based SVA model of Alfred Rappaport and adapts this within a pure equity perspective, highlighting the seven key cash flow drivers of shareholder value. These drivers are then linked as far as possible to the main headings within UK and international cash flow statements. Finally the thesis goes on to adapt and develop a testable model using research previously carried out from the "value relevance" literature. This model relates changes in overall market capitalization to changes in the key constituent cash flow drivers found within the cash flow statement. A 'backward elimination' stepwise multiple linear regression technique is then adopted to assess for several samples of companies, whether any statistical relationship exists between changes in the independent X cash flow variables identified and the dependent Y variable (changes in market capitalization.) The findings of these surveys suggest that there is a general statistical relationship existing between these variables, but concludes that no one X variable seems to have any more statistical relationship with or impact on Y than any other.

The thesis concludes with a review of the structure and findings, overall conclusions, and a range of specific recommendations for the accounting standard setting bodies to consider as additional reforms to the financial reporting framework.

CHAPTER 1: INTRODUCTION:

Over many years, despite a proliferation of accounting standards and the tighter regulation of accounting and financial reporting, total accounting book values arrived at for companies in the statutory or published reports, in many cases, bear little relationship to their intrinsic or quoted market values. Furthermore, in an economic climate of active merger and acquisition strategy, increasingly significant proportions of the published book values of the net assets of many groups of companies around the world comprise an intangible asset known as purchased goodwill. The major discrepancy between the reported accounting book values of tangible and intangible net assets and the actual prices paid for these, causes difficulties for companies and accountants when attempting to report income due to the subjectivity involved in the original valuation and in the subsequent recognition of purchased goodwill in the accounts and in the adoption of appropriate policies to depreciate or impair these intangibles against reported earnings. According to research, large premiums are often paid, even over the quoted market values of companies on acquisition, on the expectation of gaining synergies, but often too high a price is paid and thereby value is destroyed for the acquiring shareholders (Sirower, 1996).

This thesis was originally intended to investigate the goodwill phenomenon and to establish a rationale for decomposing goodwill into its main constituent drivers. This was to be achieved by reviewing the literature on goodwill, understanding its origins and causes and then to establish which factors have the most influence on the amount of recognised goodwill purchased, or inherent within a set of financial reports. The original intention therefore was to gain an understanding of accounting goodwill as a phenomenon from the accounting perspective and thereby to understand some of the key valuation issues it has and still poses for accountants.

However, as the literature review continued, it emerged that goodwill is a peculiarly accounting phenomenon as no such "value gap" as expressed in these terms exists in economic theory.

The research then focused on a comparative analysis of underlying assumptions and concepts in accounting practice with fundamental economic theory and whether these divergent paradigms can be reconciled in terms of a robust, reliable and relevant accounting approach to company valuation. The review then leads to examining the accounting literature on "clean surplus" accounting and hybrid valuation models such as economic profit and residual income, as pragmatic approaches to reconciling the accounting and economic models.

The thesis then examines the related work of US financial management theorists on company valuation. These "re-packaged" company valuation or income models, are now categorised as what are collectively known as "Value Based Management" VBM theories. (Stewart, 1991), (Rappaport, 1986 and 1998)

In the focal literature review, this thesis explores the main relevant aspects of these valuation theories, both from the UK and USA. From this an adapted cash based valuation model is arrived at, using Rappaport's cash value drivers. This model is then converted into a testable form based on the approach of "value relevance" theorists, (Feltham and Ohlson, 1995) who along with other academics in this area, attempt to empirically test key accounting variables as significant drivers of the total market value (including the book value) of a company or a share.

Finally in this thesis a pilot survey from a population of 100 quoted FTSE companies over two years is analysed by multiple linear regression techniques and discussed. From the main sample two sub-sets of this data are also tested in an attempt to validate or confirm any

findings as obtained in the original survey. This leads to some conclusions being drawn about the significance or otherwise of various constituent cash flow drivers in determining or predicting company value, and whether a normative approach to valuation is consistent with the positive behaviour of those who act as decision makers in the market place.

The structure and sequence of the thesis in detail are as follows:

Chapter 2: - The origins and nature of accounting goodwill

The first chapter of the main body of the thesis discusses goodwill by providing definitions from classical accounting textbooks and from seminal journal articles. The review traces the history of goodwill as an intellectual accounting issue in the literature between the 1920s and the 1970s. The contributions of such authors as Leake (1921), Canning (1978), Paton (1924), Lee (1971), and Chambers (1966) are discussed. Within this body of literature it is concluded that the concept of goodwill has been defined alternatively as a "hidden asset" or as "superior earnings". The chapter then goes on to conclude that these are simply two different ways of defining the same phenomenon.

Chapter 3: - The recognition and measurement of accounting goodwill

Having looked at academic contributions to the issue of company valuation and goodwill, this chapter explores the accounting standard setting bodies' conceptual frameworks and how fundamentally accepted accounting concepts determine the recognition and measurement of assets and the treatment of goodwill, highlighting the broad difference between purchased goodwill as established through an accounting transaction following an acquisition and inherent goodwill generated through organic growth.

This leads to a discussion of the lengthy debate on the recognition of goodwill and how an intellectual argument over the appropriate treatment of purchased goodwill developed. It also critically appraises where the accounting profession in the UK and internationally stood and currently stands on the issue, including a brief review of relevant aspects of FRS 10 (ASB, 1998), IAS 22 (1993), IAS 38 (IASB, 1998) and IFRS 3 (IASB, 2004).

Chapter 4: - Economic theory and the recognition of income, value and capital.

This chapter explores the relevant economics literature surrounding the valuation of income and capital, including the main contributors, Fisher (1930), Lindahl (1939) and Hicks (1946).

This chapter compares and contrasts economic with traditional accounting perspectives on asset and income recognition and measurement including the underlying concepts and conventions.

Fisher's (1930) tautological view of income and capital is explored, and Hicks' (1946) concept of economic income ex-ante and ex-post and ideal ex-post are also introduced from an individual investor's perspective and how this model can be adapted for a business entity and the implications of such an adaptation. These models give a new insight into goodwill as an accounting based measurement residual arising from timing differences and therefore an unnecessary decomposition of value in pure economic terms.

Chapter 5: - Residual income and other hybrid valuation models

This chapter explores the attempts of accountants to reconcile the economic and accounting paradigms where the concept of "clean surplus" is introduced. Since Marshall, (1920) accountants have recognised the need to account for the imputed or opportunity cost of using long-term funds for a business reflecting the risks involved.

The idea of charging profits with the "cost of capital" however it is defined and measured, is the cornerstone of such models, known alternatively as economic profit or residual income.

The chapter then moves on to discuss more recent value based management metrics such as EVA as adaptations of the residual income model. There is also a discussion of the nature of the cost of capital, how it is defined, and how it should be measured. Through the use of argument and an example, it is concluded that the use of a weighted-average cost of capital to value a company may be an irrelevance from the shareholder's perspective, as shareholder value can also be arrived at directly using appropriate net cash flows and through discounting by the cost of equity.

Chapter 6: - A comparative model for decomposing the market capitalisation of a quoted company

This chapter compares the main valuation paradigms covered in Chapters 4 and 5 through decomposing the market value of a company or group of companies in several alternative ways and gives a breakdown of market capitalisation in terms of book values of tangible and intangible assets and decomposes goodwill into its constituent purchased and inherent components. The model helps to explain the decomposition of value in terms of shareholder value, in economic terms, and under generally accepted accounting practice.

By comparing the different constituent elements of value in each model, an overall reconciliation of each value paradigm is derived, and their main differences and similarities discussed and explained. This model and the concluding discussions lay the foundation for looking alternatively at market capitalisation as representing the present value of future expected free cash flows to the company (or its owners) as is later discussed in Chapter 7.

Chapter 7: - Cash based accounting valuation models and Shareholder Value Added (SVA)

From a discussion of the detailed breakdown of the market capitalisation of a group in terms of its constituent parts in Chapter 6, this chapter moves to examining market capitalisation in a holistic sense. The chapter briefly discusses cash based measures of income and valuation, concentrating on Shareholder Value Added (SVA). This model and its main assumptions and limitations are explained and critically evaluated, with a practical adaptation of the SVA model (Rappaport, 1998) being used to illustrate a useful way of valuing quoted companies, extracting and adapting historical and generally available published accounting data.

Chapter 8: - Value relevance and the derivation of a testable model

This chapter reviews the focal research literature on empirical value relevance studies based originally on the work of Ohlson (1995) and Feltham and Ohlson (1995). These studies all use the Edwards-Bell-Ohlson (EBO) model to decompose market value into the constituent elements of clean surplus earnings and accounting book values, and then convert these identities into multiple regression models using linear information dynamics (LID). This chapter then builds from the main EBO identity derived by Feltham and Ohlson, producing a cash flow based testable model based on the underpinning assumptions of Rappaport's SVA model and the six or seven key value drivers he identifies. The chapter finally develops a model where shareholder value is, in theory, a function of a range of cash flow variables relating both to Rappaport's model, and to the main headings in FRS 1 (Revised).

Chapter 9: - Methodology

This chapter describes, explains, and justifies a methodology for using a multiple linear regression model and appropriate techniques to measure and analyse whether a statistical relationship exists between any of the constituent cash flows generated by a company and its

overall shareholder value, building on the fundamental material covered in Chapters 4, 5 and 6. The chapter then goes on to explain the methodology used to test the model derived in Chapter 8, justifying the choice of the samples selected, the periods covered and the variables tested. It also identifies the main sources of data and how they were obtained.

Chapter 10: - Analysis of results and findings

This chapter presents and discusses the original null and alternate hypotheses and the results of the multiple regression analysis using "Data analysis" from the Tools menu of Microsoft Excel™ based on a pilot sample of 100 FTSE companies over two years and two further sub-sets of this data. The relationship between the constituent cash flows movements and any periodic changes in company value is measured. The relative statistical significance of any relationships between the independent and the dependent variables are identified and measured, highlighting any limitations of the research method adopted and of the samples selected. Opportunities for future research are also identified and discussed.

Chapter 11: - Conclusions and recommendations

This final chapter begins by reviewing the aims, objectives and structure of the thesis. The chapter also concludes on the findings from the literature review and from the empirical study and makes some recommendations about the kinds of data and information likely to be of most use to analysts or investors who wish to place reliable valuations on companies from a normative standpoint. Finally, recommendations are made to help improve the relevance of external financial reports for the principal users of accounts.

CHAPTER 2: THE ORIGIN AND NATURE OF ACCOUNTING GOODWILL

In this chapter, purchased and inherent goodwill as accounting phenomena will be explored beginning with the earliest definitions and references to it in the academic literature.

Lord Eldon in the Cruttwell v Lye (1810) case stipulated that:

> *The goodwill that has been the subject of sale, is nothing more than the probability that the old customer will resort to the old place*

(Lee, 1971, p320)

This simplistic definition encapsulates the essence of goodwill, that it is dependent on the future business (i.e. sales) as being the original source from which profit (attributable to the owner) is the residual amount. Without customers a business will have no value, therefore the overall valuation of a business must in truth depend upon the anticipation of future business.

One of the earliest and arguably the most apposite definitions of goodwill was that of Samuel Johnson (1781), when persuading the merchants Barclays to purchase the late Henry Thrale's brewery in London:

> *We are not here to sell a parcel of boilers and vats, but the potentiality to grow rich beyond the dreams of avarice*

(Johnson 1781)

This definition clearly identifies goodwill as that part of the price paid for a going concern (rather than for an *ad hoc* collection of assets). The payment for goodwill is seen as

representing compensation to the previous owner for giving up the rights to future benefits that the ownership of that concern will bestow to the new owner. The key aspect here is that value is dependent on future events not on what has happened in the past. It is clear from an understanding of the definition of an asset that what the future holds is crucial in determining their recognition and measurement.

Canning (1978, p.22) also recognised the future as being critical to the value of an asset.

> *An asset is any future service in money or any future service convertible into money..."*

Canning (1978, p.40) also states the following:

> *All will agree that future income constitutes the sole source of an enterprise valuation*

Spacek (1964, p.297) also emphasised the relationship between goodwill and profits:

> *Goodwill is the present value placed on anticipated future earnings in excess of a reasonable rate of return on producing assets. Thus, it is the cost to the buyer of earnings over and above the cost of the assets required to produce these earnings*

This superior earnings notion is also incorporated in a definition of goodwill in Canning (1978, p.188)

> *...The value of the power to earn in excess of the rate on cost that is necessary to induce men to engage in the enterprise under consideration*

Lee (1971), refers to Francis More (1891) who is another contributor who also recognised the superior earnings argument when he argued that goodwill was the present value of business profits in excess of a normal rate of return.

This "excess earnings" approach referred to above infers that goodwill represents an excess of returns over the normal rate of return that the identifiable net assets can earn. They state that goodwill is merely the present value of the anticipated excess earnings discounted over a number of years at an appropriate discount rate.

Ma and Hopkins (1988) also use the superior earnings perspective from which to derive their definition:

> *Goodwill is viewed as the capitalised value (i.e. the present value) of the stream of superior earnings of the business to be acquired*

Lee (1971) argues with the notion that goodwill as an asset can be isolated in this way, and criticises those who believe that total business profits can be arbitrarily divided between normal profits as earned on tangible assets and super profits earned on intangibles such as goodwill. He explains that this argument ignores the business as a going concern, and ignores the fact that all assets in an enterprise work in tandem with each other, interacting and combining with one another to earn the overall profits. Hendrikson (1970) also argues the point about the interaction of factors in the production of the final product or service, and the artificiality of trying to allocate a portion of the total value of a firm on the basis of the capitalisation of superior earnings.

However, Canning (*1978, p.39*) recognises the problem of separately valuing each asset as a component of value based on its contribution to future income as a hopeless task:

But no comprehensive analysis of this character is possible, nor are the elements capable of statistical treatment. It is as if the physicist were to attempt to write the equations for the paths in space of each molecule of gas confined in a vessel. Life is not long enough to permit success

Paton (1924, p.310) also considers that goodwill and intangibles are difficult to identify separately and defines intangibles comprising goodwill as:

.... the residuum, the balance of the legitimate values attaching to an enterprise as a totality, over the sum of the legitimate values of the various tangible properties taken individually. That is, the intangibles measure that part of the company's asset total which might be said to reside in the physical situation viewed as a whole, but which cannot be considered - except upon some highly arbitrary basis - to inhere in, or have residence in, specific units of plant, equipment etc.

Again, Yang (1927), like many others, also relates the value of intangibles to the superior earnings power that these produce for the company, over and above those produced by the tangible assets. However, he also recognises the problem of intangibles and their inseparability.

... the value of intangibles is essentially an expression of superior earnings power of the specific concern, and that on account of this fact there is inevitably a close and inseparable relationship between the intangibles as a group

Yang (1927)

Lee (1971) however, tries to address the important distinction and confusion between defining the nature of goodwill and its valuation. He has argued that although identifying the superior

earning power of the discounted future cash flows generated may be a starting point for valuing goodwill, it does not explain its nature.

Lee (1971) lists many factors identified as contributing to goodwill, such as development costs, staff qualities, training, patents etc. He goes as far as to deny that goodwill, as an asset even exists.

> *It is a word that conveniently describes a number of business resources contributing to the overall profitability of the business*

(Lee, 1971, p320)

This approach is known as the "hidden assets" approach, and has been referred to by Colley and Volkan (1988). They refer to Tearney (1973), who argues that goodwill can be fully explained away by identifying a number of identifiable intangible assets. The "hidden assets" approach by implication would argue that there are no "superior earnings" to be earned, merely that these will be observed when some of the underlying assets are either undervalued or unrecognised. Therefore the true rate of return needs to be calculated by a comparison of earnings to an appropriate valuation of net assets, including tangibles and all intangibles.

Lee (1971) points out that some of the "hidden" factors he identified are tangible in nature, some are within the control of the organisation, and others outside the control of the organisation. The question of hidden assets such as goodwill, other intangibles, and unrecognised tangible assets, is an admission that the accounting measurement system has its weaknesses, in that some assets are not being recognised as they should, or are not being valued correctly.

The question of controllability of assets is an important issue in the recognition of assets or otherwise. If the business does not control a resource, is it really an asset that should be

recognised? To answer that question it is necessary to refer to the Accounting Standards Board (ASB), or the International Accounting Standards Board (IASB) definition of an asset in the Framework for the Preparation and Presentation of Financial Statements (IASC, 1989) and in the Statement of Principles (ASB, 1999) to establish whether control is a necessary element in establishing the recognition of an asset. It would seem that control of the benefits arising from rights or other access to resources is needed. However, is control of the resource itself necessary to control the future benefits that the resource yields? For example it may not be within the control of a retail outlet that the local council demolishes adjacent derelict houses and replaces them with a car park. What is sufficient is that the benefits from additional business generated by the proximity of the car park are flowing directly into the funds of the business and therefore come within its control.

Canning (1978) gave examples of the kind of situation bringing about goodwill, such as the non-recognition or under valuation of assets, and states that separable items of future income associated with particular assets are either ignored or undervalued. The examples he gives include the following:

1. Services of the general manager worth more than he has agreed to accept.
2. No account taken in the books of a long succession of sales orders placed but not yet filled at the time of closing the books.
3. Services of land under a lease contract , the terms of which have turned out to be extremely favourable.
4. Land in a location more favourable than it appeared to be at the time it was bought.
5. Machinery, the valuations of which are based upon its cost in the market place, but which have a greater value for the business in the particular use to which it is put.

Canning (1978) makes the point that it is no surprise that when many components of value are either not recognised or under valued, that returns on capital employed measured upon this basis will show higher returns than those of companies who do recognise and appropriately value such assets. It could also be argued from this that over a period of years, expenditures

on acquiring assets having a greater value in use than that expended on them, will contribute to an ever increasing future stream of income. This will lead to continuously increasing returns on capital employed, as the net asset denominator figure becomes increasingly out of date in comparison with the income numerator.

Chambers (1966), like Lee, disputes the fact that goodwill is an asset and explains that the reason one company earns superior profits compared to another is based on the synergistic interaction of a combination of assets working in concert and with the market. He explains goodwill within the context of a business entity:

> *Goodwill subsists in its (the entity's) collection of assets and liabilities and the advantages which flow from them as they are arranged amongst themselves and in relation to the market; it does not subsist in any separable thing.*

Chambers (1966, p.209)

Chambers (1966) argues that goodwill is not an asset because it is neither separable nor measurable, but he does admit that it is capable of evaluation, although such evaluations being comparative would vary over time. However, if goodwill is capable of evaluation it surely must be capable of measurement even if the method of measurement is crude. The objection to goodwill being an asset due to its inseparability is a weaker argument, and is consistent with the logic of Chambers' (1966) theory of net realisable value accounting, where all assets and liabilities are valued at their cash equivalent exit prices. However, because exit prices for non-separable assets are difficult to establish in the market place, this does not mean that these assets cannot be valued or are not capable of contributing to future economic benefits. Canning (1978) discussed the problem of inseparability of assets and the related issue of synergy, when he uses the example of the pair of shoes and the outfit. He states that the service of a pair of shoes is worth more than twice as much as the service of either shoe worn alone. The service value of the pair of shoes, and the service value of the outfit excluding the

shoes are worth less than the service value of the whole outfit as an ensemble. This is true of companies and their assets. Assets working together produce more future benefits in concert than they would be capable of separately. This poses the question: How is it possible to place values on separate elements that the owner only utilises in combination with other assets? Listing individual assets and attaching separate values to them in isolation based on past transactions or events may be at best over conservative, and at worst misleading. This is particularly the case if an exit value approach is taken and where the absence of the asset inhibits the productive capability of the other assets or renders them useless.
Canning (1978) refers to the example of a mine owner and a missing boiler tube, and the fact that the mine owner would be willing to pay anything up to $100,000 for the tube, if the going concern as a whole was valued at that amount. He argues therefore that without it, the mine would be inoperable and therefore worthless.

The ICAS Report (1988) "Making Corporate Reports Valuable" suggested that goodwill should be reported as the difference between the present value of the firm as a whole and the net realisable value of the individual net assets. Presumably this suggestion recognises that part of goodwill represents the synergistic value of the firm as a whole over and above the current values of the separate net assets. This argument therefore follows closely the views of Chambers (1966).

It is then strongly arguable that even the measurement and proper valuation of many tangible assets is fraught with difficulties when separate valuations are required on an individual basis. This is because significant amounts of their aggregate value may be attributable to their use in concert rather than in isolation, and as they jointly contribute to future economic benefits.

Arnold *et al* (1992) also discuss synergy with respect to goodwill, and classify "jointness of activities and market imperfections" as one of the three main constituent elements of goodwill

they identify. The paper also discusses goodwill and its nature as an asset or otherwise, referring to the economic law of synergy:

> *Given the economic law that "the whole is often greater than the sum of its parts" this process will inevitably leave a remainder which is not itself an asset or a liability of the same logical category as the assets and liabilities now identified. However, treating it as if it were another such asset is the only logical consistent and neutral way to "undo" the transaction.*

Arnold et al (1992, p 36)

The existence of the two fundamental perspectives on the essential nature of goodwill in the literature would suggest that little consensus exists on the nature of goodwill. But is there any substantive difference in these views or are they two ways of looking at the same thing?

The acceptance of superior earnings, when relating anticipated income to recognised net assets, either suggests that the assets listed in the accounts from which the earnings are derived are themselves undervalued, or that the source of those future earnings is associated with other assets which are not being recognised.

That is to say, every income must have a capital, and from every capital must derive an income. This tautological argument is derived from neo-classical economics, and would suggest that superior earnings are a misnomer, and evidence of superior earnings merely reflects the existence of "hidden assets" however these may be identified or disaggregated from the wider pool of business assets.

Goodwill is much more readily recognized when a transaction that establishes it takes place. This is because the difference between the fair value of the net assets of the acquired company and the price actually paid is measured and recorded. Purchased goodwill therefore arises

when one business takes over another and the price paid for the business as a whole or a controlling proportion of that business, exceeds the fair values of the aggregate net assets acquired. In this situation it is much easier to establish goodwill as an asset, as it then substantially falls within the IASC 'Framework' (1989) and the ASB 'Statement of Principles' (1999) definitions of an asset arising from a "past transaction or event" and being measurable in monetary terms.

The main point about the measurement of goodwill is that valuation of an entity is unique to the valuer and this point is critical to the understanding of the nature of the goodwill. Goodwill is a perception of value and as it is based on future events, its valuation will depend upon how these future events will be shaped, and by whom. There may be an element of synergy in that a buyer may well see how the acquired business will fit into the business already owned, in terms of sharing common facilities and networks etc. Such a buyer will be willing to pay a premium for this that another buyer would not benefit from and would not be prepared to pay for.

Ma and Hopkins (1988) state that it is frequently impossible to disentangle the flows attributable to the acquisition once it has been undertaken because of the synergy within the new group. It is therefore very difficult for an independent valuer to arrive at an objective valuation for a business, without knowing who is intending to purchase, or what their particular situation is, and their future intentions are. Any valuation that is arrived at must be recognised as only applying at that time and while plans and expectations of the future remain the same.

Lee (1971) has also made this point about the volatility of purchased goodwill and the fact that although its valuation may be established at the point of acquisition, its value at the date of disclosure may be considerably different. He argues that once the price has been paid for

the goodwill, it becomes like any other asset, a past capital cost and therefore the figure loses its currency and relevance:

> *It no longer remains a figure representative of current expectations of the future. Instead it is representative only of past expectations of the future*
>
> Lee (1971, p.323)

Lee's (1971) view could be taken further. At worst, purchased goodwill may become representative not only of past expectations of the future, but eventually of past expectations about the past! However, the fact that the acquisition of goodwill is verified at a single point in time by a transaction or event requires it to be accounted for. The way in which the acquired goodwill is accounted for has for the past twenty years been a source of intense academic debate, both in terms of selecting from available alternatives, and with respect to attaining consistency with the treatment of internally generated or inherent goodwill.

Nelson (1953), in putting forward his momentum theory of goodwill, argues that the purchased goodwill is paid for as a consideration for the momentum created by previous expenditure made by the entity. He also argues that the "push" given by this previous expenditure is not continual and everlasting. New energy must be fed into the momentum to keep it going. He emphasises that if goodwill in total is maintained, purchased goodwill is gradually replaced (over he suggests 2 to 12 years) by "self-developed" goodwill. However, this does not negate the logic of amortising the goodwill that was originally purchased. He warns of the inconsistency of not amortising goodwill despite the fact that at any point in time total goodwill within the business will inevitably comprise a proportion of self-developed goodwill:

> *It is submitted that this procedure is inconsistent with the condemnation of the recognition of the self-developed goodwill*
>
> Nelson (1973, p 401)

Therefore, purchased goodwill, like any other capital asset, must have a finite value, as the expenditure which created it will not continue to provide future economic benefits indefinitely.

The view that purchased goodwill does have a finite life was also put forward by Leake (1921). He explained that purchased goodwill or the level of "super profits" expected in the future might be thought of in terms of an annuity, which is dependent on the term over which the annuity is received and upon the rate of interest prevailing. Both will determine the capital value of the goodwill originally paid for. The interest rate, he argues, is dependent upon the risk, and upon the particular circumstances facing the business in any particular case. The logic of his argument is that receipts of future "super profits" can not be as valuable as those received earlier, and that therefore it is obvious that the value of purchased goodwill must inevitably diminish over time. Hicks (1946) referred to periodic expectations of such future benefits as "prospects", and as these prospects are realised, the value of capital will be diminished unless some proportion of the periodic "prospect" realised is re-invested in order to realise some other alternative "prospect". Leake (1921) supports this point when he states that allowing for a rate of interest of 10%, no less than 95% of the present value of a perpetuity will have expired by the end of 31 years, on the grounds that beyond that time the value becomes negligible in present value terms. He therefore concludes that:

> *It may be safely stated that capital outlay on the purchase of goodwill inevitably expires year by year, whether the profits of an undertaking are increasing or decreasing.*

Leake (1921, p.77)

Having examined various definitions of goodwill, attempts at explaining its nature, and the accounting problems of distinguishing between inherent and purchased goodwill, several conclusions may be drawn from the main accounting literature.

The first issue is whether goodwill is really an asset at all. Several commentators deny this, most notably Paton (1924), Lee (1971) and Chambers (1966). Their arguments revolve around the fact that, in their view, goodwill cannot be clearly decomposed into specific assets as a source of future income streams, nor are these assets in most cases separable from the entity as a whole. Paton (1924) saw intangible assets as measuring that part of the company's asset total which might be said to reside in the physical situation viewed as a whole, but which cannot be considered to exist inherently in specific units of plant, equipment etc. Lee (1971) describes goodwill as the collection of business resources contributing to future profitability, and Chambers (1966) emphasises that the source of goodwill doesn't reside in any separable thing, but in the advantages created by the assets in combination and in relation to the market. All these views therefore imply the existence of synergy. It is clear therefore, that some proportion of goodwill resides in relation to the earning potential of the entity as a whole, as opposed to the aggregate expected future cash flows associated with identifiable individual assets and liabilities held by the entity.

The extent to which synergy accounts for goodwill as opposed to other identifiable intangibles, seems to require considerable additional empirical research. It is necessary therefore to establish the extent to which goodwill comprises synergistic factors, and to what extent it comprises "hidden assets". These would include the under valuation or non-recognition of tangible assets, and the under valuation and non-recognition of separable intangibles.

In the next chapter the treatment of goodwill by the accounting standard setting bodies will be discussed, including a review of the debate in the 1980s and 1990s revolving around the issue of whether purchased goodwill should be capitalised or immediately written off against reserves. The former is now almost universally accepted because of very good conceptual and theoretical reasons and the IASB since March 2004 have recommended that purchased goodwill should not be systematically amortised, but periodically assessed for impairment (IFRS 3, 2004)

A serious consistency problem is caused if inherent goodwill within companies growing internally or organically is never subject to accounting valuation, whilst inherent goodwill *purchased* by an acquiring company is properly recognised and valued.

It is necessary to examine and carry out clear empirical research in order to establish the true nature of goodwill, in response to the recommendations made in much of the recent literature on the subject, so that goodwill, whatever its nature, can be accounted for consistently and reliably. However, to achieve this it may be necessary to empirically identify and explain the main constituent drivers of goodwill.

It will also be necessary to measure the extent to which goodwill can be accounted for by the proper recognition and valuation of separable tangible and intangible assets, and to what extent it is inherent in economic and market phenomena. In assessing the extent to which economic and market phenomena are important, a distinction will need to be established between those economic and market factors specific to the company and its immediate trading environment and to those factors extraneous to the entity itself. These would include factors affecting the capital markets, such as economic, fiscal, social and political influences. This distinction will be highlighted in Chapter 6, by distinguishing the extent to which the market is concerned with individual company performance or with wider sectoral or market factors.

Conclusions

The accounting literature has frequently referred to the nature of goodwill as "superior earning potential" as put forward by Yang (1927), and Ma and Hopkins (1988) amongst others, and the notion of "hidden assets" as referred to by Tearney (1973), Canning (1978) and Lee (1971). Philosophically it could be argued that there is no substantive difference between the two approaches. Both implicitly accept the economic notion that superior earnings must relate to the source of those earnings, except the latter explains the

phenomenon by focusing on the non-recognition of assets, while the former focuses on recognising income while ignoring the underlying assets. This relationship between capital and income is firmly rooted in economic theory and for this reason it is important to review the main contributions within this body of literature in order to gain further insight into the related issues of income and capital recognition and measurement, and their inextricable relationship. The understanding of fundamental economic theory will serve to place the goodwill issue in accountancy within a wider context. This will be covered later in Chapter 4.

CHAPTER 3: THE RECOGNITION AND MEASUREMENT OF ACCOUNTING GOODWILL

After reviewing the nature of goodwill and its sources in the previous chapter, it is now appropriate to examine the UK and international regulatory bodies' recent position on financial reporting and how goodwill as an important element is accommodated within this.

The function of this chapter, within the context of the aims of the dissertation as a whole, is to explore the recent position of the accounting standard setting bodies in the UK and internationally on the overall purpose of financial reporting in the provision of relevant information for stakeholders and to support decision making. The chapter begins by discussing the theoretical framework of financial reporting as produced in the Statement of Principles (SOP) developed in the UK (1999) and in the 'Framework for the Preparation and Presentation of Financial Statements' published earlier (1989) by the International Accounting Standards Committee (IASC). This sets the discussion of a valuation paradigm for accounting into a conceptual framework, with clear reference to fundamental accounting principles and generally accepted accounting practice. This general discussion then concentrates on the more specific issue of the recognition and measurement of goodwill as a phenomenon already discussed at some depth in the previous chapter. Within this discussion emerges the arguably irrelevant distinction between goodwill that is purchased and goodwill that is inherent or "home grown". The material in this chapter then explores how generally accepted accounting principles rationalise the treatment of these two types of goodwill and how conflicting approaches to accounting measurement and recognition of goodwill has still to be satisfactorily resolved as an issue in financial reporting. The distinction between accounting recognition and the measurement of purchased as opposed to inherent goodwill goes some way in explaining how a "value gap" exists between accounting book values and economic value as later explored in Chapter 4. This distinction between purchased and inherent goodwill is also developed upon in Chapter 6 where alternative valuation models,

including the traditional accounting model, are compared in a comprehensive group valuation example.

The International Accounting Standards Committee (IASC) initially issued its "Framework Document" (IASC, 1989) and then the UK Accounting Standards Board (ASB) later issued their *Statement of Principles of Financial Reporting* (ASB, 1999) along similar lines. These documents are comprehensive attempts to produce a definitive and coherent conceptual approach to issues of measurement and recognition in reporting the financial performance and position of business entities and serve to guide the issue of financial reporting standards.

Firstly, both the Statement of Principles (SOP) and the IASC 'Framework' identify several groups of users, broadly in line with those identified in the Corporate Report (1975), Stamp (1970) and Solomons (1986).

These groups include employees, lenders, suppliers and other creditors, customers, government and their agencies, and the public. However, the SOP in particular is quite clear in the way that it focuses on the investor group and to some extent plays down the existence of conflicting needs, arguing that the main target group of users for financial reports are those providers of risk capital.

> *Financial statements that meet the needs of providers of risk capital will also meet most of the needs of other users that financial statements can satisfy*

(ASB, 1995a, p.36)[1]

The main needs as identified by the SOP can be satisfied by producing information about the financial position, performance and financial adaptability of the enterprise. The way in which

[1] Where page numbers are referred to when quoting the Statement of Principles; these page numbers apply to the 1995 Draft Statement of Principles not the revised 1999 version.

this need is met is by an evaluation of the enterprise's ability to generate cash and the timing and certainty of its generation.

> *The economic decisions that are taken by users of financial statements require an evaluation of the enterprise's ability to generate cash and the timing and certainty of its generation*

(ASB, 1995a, p38)

The implication of this quote from the ASB that cash flow is a key performance indicator presumably derives from the acceptance of economic theory where the notion of income, value and capital is based fundamentally on expectations about the amounts, timings and certainty of future cash flows and not on past accounting earnings.

The SOP then argues that information on cash flows and the capacity for an enterprise to generate them can be obtained from a report on its financial position. This involves identifying the resources it controls, its financial structure, its liquidity and solvency, and its capacity to adapt to changes in the environment in which it operates. According to the SOP, this information is obtained from the balance sheet. The SOP also states that the underlying performance achieved by the enterprise from the resources it controls, is best provided by the profit and loss account and the statement of total recognised gains and losses (STRGL), while specific information on cash flows should be provided in a cash flow statement. The SOP emphasises the equal status of all primary statements and the inter-relationships that exist between them as they reflect different aspects of financial transactions.

The SOP also discusses qualitative characteristics of useful information and identifies primary and secondary characteristics and emphasises the trade off that needs to be exercised between the primary and often conflicting qualities of relevance and reliability. Much of the content of this section is drawn from the original work of Sterling (1970), and of the Trueblood Committee (1971).

Relevant information is defined as:

> *When it has the ability to influence the decisions of users by helping them evaluate past, present or future events or confirming, or correcting their past evaluations.*

(ASB, 1995a, p.42)

Relevant information has either "predictive" or "confirmatory" value and these are interrelated in the sense that useful information must be able to provide feedback to those who make predictions with such information, as to whether these predictions are in the fullness of time confirmed by actual events. However, for relevant information to be useful it must also be reliable. Reliable information is defined by the SOP as follows:

> *Information has the quality of reliability when it is free from material error and bias, and can be depended upon by users to represent faithfully what it either purports to represent or could reasonably be expected to represent.*

(ASB, 1995a, p.44)

The SOP in section 2.14 (p. 44) then discusses the necessity of information to have both primary qualities to be classed as useful. It states that relevant information can be so unreliable in nature or representation that its recognition in the financial statements may be potentially misleading. The SOP then examines the elements of financial statements and defines assets in the following way:

> *Assets are rights or other access to future economic benefits controlled by an entity as a result of past transactions or events.*

(ASB, 1995a, p.53)

The key elements in this definition are that assets may not necessarily be tangible, in as much as they may only consist of rights (or other access) to future economic benefits deriving from the assets and that these rights or access do not need to entail legal ownership of the assets. The definition also specifies the requirement for an element of control to exist, which also implies the ability to restrict or curtail the access of other parties. However, a key element in the definition is the requirement that an asset must exist as a result of past transactions or events. To some extent it is this final element that restricts the definition from being almost all-inclusive in terms of recognition. This ensures the recognition of an asset in an objective and verifiable fact.

However, it is not clear from this definition, or from further explanation, whether the particular past transaction or series of events need to be specifically identified for the asset to be recognised.

The SOP also discusses the recognition, de-recognition, and the measurement of assets and liabilities, and states that recognition, de-recognition, or subsequent re-measurement should only occur if certain criteria are met. Evidence must exist that either an inflow/outflow of benefit is expected, or that it is no longer expected, or that the amount of inflow/outflow of benefit expected has changed in some way. This evidence must also be capable of measurement at a monetary amount with sufficient reliability. Any changes in total assets not offset by an equal change in total liabilities will give rise to a loss or gain. The type of loss or gain will depend on the nature of the change in asset or liability, and will determine whether the gain or loss will be recognised in the profit and loss account, or the statement of recognised gains and losses.

The view that changes in assets and liabilities give rise to gains and losses which then need to be recognised in the two performance statements has become known as the "balance sheet paradigm" or the "valuation" model. In this model income is treated as a residual measure

from a comparison of net assets as between two points in time. This approach to financial reporting has its roots in the fifteenth century in the accounting approach taken by Venetian merchants in the *commenda* system of trading ventures (de Roover, 1956). However, this philosophy faces some opposition from "traditionalists" who oppose the ASB's balance sheet approach, arguing that the profit and loss account should not be, as they believe it is, treated as a secondary statement. For example Davies and Davies (1996) took the view that the balance sheet is in fact secondary to the profit and loss account and is therefore only a residual statement of balances left after the due process of matching expenditure against income has been completed.

Their press comment on the original ASB 1995 Draft Statement of Principles stated:

> *The ASB's November exposure draft Statement of Principles for Financial Reporting proposes to abolish both the matching/accruals and prudence concepts. The profession's traditional wisdom, based on generations of practical experience, is being abandoned.*

Davies and Davies (1996)

Indeed, matching as a principle has been a fundamental tenet of accounting and this has been cogently argued by, amongst others, Paton (1937), and Littleton (1940), but on the other side of the argument the whole approach has been attacked by Thomas (1979).

The SOP is clear that it sees the financial position of shareholders as of primary importance, and states that gains and losses should be recognised when there is sufficient evidence that a change in net assets (i.e. ownership interest) had occurred before the end of the reporting period. This is indicative of the "valuation" approach of the ASB to the recognition of business income. The ASB emphasises that more evidence is required to recognise a gain than a loss, so contrary to the assertions of Davies, and Davies (1996), the ASB is not in fact

abandoning the prudence concept. The SOP in section 4.35 (p.76) states that where expenditure leads to future economic benefits, but where these can 'be only broadly or indirectly determined, or intermediate values of the assets cannot be directly obtained with sufficient reliability' the asset should still be recognised. But such an asset should be written off in a systematic way over its useful economic life.

The SOP emphasises the importance of sufficient evidence being required to support the change in an element of a financial statement.

However, it recognises that:

> *What constitutes sufficient evidence is a matter of judgement in the particular circumstances of each case: the evidence must be adequate, but need not be (and usually cannot be) conclusive.*

SOP (1999, p.77)

The SOP also recognises the need to make use of "reasonable estimates", based on measurable information available at the balance sheet date. A key passage here is that evidence may be provided by transactions of other entities in similar assets and liabilities.

> *Where such transactions are frequent and the items traded are very similar to the one held by the entity (i.e. there is an efficient market in homogeneous items), the evidence will be strong and is likely to be sufficient for recognition.*

SOP (1999, p.77)

For evidence to be sufficient it must be reliable. For it to be reliable, evidence must be measurable in monetary terms. If it is subject to great variability, it must be capable of verification, through a market based measure, which requires a reasonably efficient market for

the item in question, and there must be a minimum monetary value that may be placed upon the item.

In terms of measuring elements in the financial statements, although this line was abandoned in the final version, the Draft SOP (1995a) firmly leant towards the increased use of current values, without explicitly advocating a systematic inflation method for financial reporting:

> *The Board believes that practice should develop by evolving in the direction of greater use of current values to the extent that this is consistent with the constraints of reliability and cost.*

(Draft SOP 1995a, p.93)

The SOP chapter on presentation identifies the primary statements to be included in the financial report. Of these, much material is devoted to the purposes of the statement of total recognised gains and losses which allows for a more valid measure of the gains and losses that the entity may have accrued or incurred. The new approach allows unrealised gains to be measured and recognised as a part of the primary performance statements, which would not have previously passed the "realisation test" for inclusion in the traditional profit and loss account or income statement. This "all inclusive approach" gives users a much more immediate and accurate picture of the financial position of the entity at the reporting date, and to some extent tackles the problem of "reserve accounting". The SOP also states that an item should be disclosed separately if its disclosure is likely to be significant for appraising the stewardship of management, or as a factor in assessing or reassessing future performance and cash flows.

Finally in the chapter on the reporting entity, the SOP discusses acquisitions and the goodwill problem. In this section goodwill is explained as arising from the difference in the purchase price of the investment stated at cost, and the fair values of the assets and liabilities of the

acquired entity. This is explained as arising because the consideration paid for the acquisition would reflect the expected future cash flows arising from adding the acquired entity in to the group.

The SOP then goes on to state:

> *However, financial statements do not represent expected future cash flows directly; rather they identify, recognise and measure specific assets and liabilities controlled or borne by the reporting entity as a result of past transactions or events. Goodwill arising on an acquisition essentially forms a bridge between these two different bases of recognition and measurement*

SOP (1999, p124).

To some extent this statement explains that although for an asset to be recognised, future economic benefits in terms of directly or indirectly generated future cash flows must be accessed, an asset need not necessarily be valued in terms of the future cash flows it is expected to generate. This statement also highlights the difference between looking at the entity as a whole, or looking at it as a disparate collection of individually itemised assets and liabilities, acquired in piece-meal past transactions or commercial events. In addition, this statement explains the inadequacy of the present financial reporting system to meet the main objective of financial reports, as referred to previously; that of providing an evaluation of the enterprise's ability to generate cash and the timing and certainty of its generation.

Overall, the ASB *Statement of Principles* and the IASC Framework provide a valuable backdrop to the discussion of goodwill. There is an explanation of the purposes of accounts, who the intended target audience and their needs are, what the qualitative characteristics of useful information are, and how assets, liabilities and therefore gains and losses are defined, recognised, de-recognised, and measured. Such a framework for financial reporting provides useful reference points in attempting to understand the nature of goodwill as a key element

within financial statements, how it may be recognised, measured, and how changes in it may be dealt with in terms of recognising potential gains and losses for shareholders.

Looking at the history of standard setting in the UK on goodwill, SSAP 22 is the natural starting point. SSAP 22 (1984) recognised under Point 5 that there is no difference in character between purchased goodwill and inherent goodwill, only that the former has the attribute of being verified at a particular point in time through a market transaction. SSAP 22 essentially allowed the company a choice of immediately writing off the goodwill to consolidated reserves or capitalising goodwill and amortising it over its useful economic life.

The original standard, consistent with the 4th Directive of the EU, stated that the preferred approach was to eliminate purchased goodwill from the accounts by immediate write-off against the acquiring company's reserves in the consolidated statements. The main argument for doing so was to maintain consistency with the treatment of costs associated with inherent goodwill, which are not capitalised (other than in exceptional circumstances, covered by accounting standards and company law).

In Appendix 1 of SSAP 22, the factors to be considered in determining the useful economic life of purchased goodwill were discussed with respect to the choice to capitalise the goodwill and write it off. The appendix accepted that purchased goodwill may be gradually replaced by inherent goodwill resulting from investment expenditure undertaken by the company post-acquisition, but precluded taking account of such expenditure in determining the useful economic life of the originally purchased goodwill. This led to the apparently perverse situation where a company's total goodwill might have been growing, but goodwill write-offs continued to be made through the profit and loss account or income statement. The factors identified in SSAP 22 as determining the economic life of the purchased goodwill were as follows:

1. Expected changes in products, markets, and technology.
2. Expected future service potential of employees.
3. Expected future demand for products and services.
4. Expected changes in competition or other economic factors that may affect current advantages

It was therefore argued that after considering the combined effect of these factors, a calculation of the net present value of the future cash flows from the investment may be possible. The timings of the cash flows expected would in effect establish an upper limit on the amortisation period to be set.

SSAP 22 therefore accepted that it was possible to establish a valuation of an investment, based on an estimation of future cash flows, and that these estimations may provide an objective enough guide for the amortisation period to be set for purchased goodwill.
This point was further developed upon in one of the ASB's working papers on goodwill, "Goodwill and Intangible Assets" (ASB, 1995b). In this paper "impairment tests" for goodwill were recommended for income generating units, based on assessing the "recoverable amount" which is a comparison of the carrying value with the greater of market value and the value in use or net present value. This method essentially allows the company to compare annually the carrying value of intangible assets with their market values and values in use. If impairment has been observed, the paper recommended that any difference should be written off, firstly against any goodwill carried within that unit, then against the recognised intangibles within the unit, then finally pro-rata against the tangible assets within the unit.
The paper accepted that in some cases no write-down needed take place, as long as the market value at least matched the carrying amount. The main departure from the line taken in SSAP 22 in the ASB's working paper on goodwill, apart from the recommendation to reject the SSAP's "preferred approach", was the blurring of the distinction between the value of

internally generated goodwill and that of purchased goodwill when undertaking "impairment tests".

> *Intangible assets and goodwill having finite expected useful economic lives should be depreciated over the period of those lives. Intangible assets and goodwill having indefinite economic lives should not be depreciated*

ASB (1995b)

However although total goodwill may have an indefinite economic life, purchased goodwill, like any other capital asset, must have finite value, as the expenditure which created it will not continue to provide future economic benefits indefinitely. This point is also supported by the ASC in Exposure Draft 47 (ASC, 1990)

> *.. goodwill purchased at the date of acquisition does not have an indefinite life. The attributes that are valued and acquired in the purchase transaction are not considered to last for ever, even though it is possible only to establish an estimated date by which they will all be eroded.*

ASC (1990, pp.35-36)

For the ASB in 1995, to accept that aggregate goodwill within an income-generating unit may have an indefinite life, a *de facto* admission is made that internally generated goodwill within that unit generated since the original acquisition was made should be recognised.
SSAP 22 however was clear that only the purchased goodwill could be considered in any estimation of useful economic life:

> *However, in determining the useful economic life of purchased goodwill, the effects of subsequent expenditure or other circumstances affecting the company after the date*

of the acquisition should not be taken into account, since these would have the effect of creating non-purchased goodwill.

SSAP 22 (1995, Appendix 1, Point 1, p5)

The regulatory bodies had, by allowing capitalisation, therefore accepted that the value of purchased goodwill may be periodically reviewed and objectively measured, in some cases up to 20 years beyond the date at which the goodwill was originally purchased. This is despite their recognition of the volatility of goodwill over relatively short periods of time and its highly subjective nature. This has now been further established in generally accepted accounting practice internationally through IFRS 3 (IASB, 2004) requiring all goodwill to be capitalised and assessed periodically for impairment which *de facto* is tantamount to allowing the recognition of inherent goodwill on the balance sheet.

The debate between the advocates of the immediate write off approach and those who prefer the method of capitalising and amortising goodwill had been unnecessarily long and drawn out. Although the original SSAP 22 preferred the immediate write-off approach, this was severely criticised by many at the time, both within the membership of the regulatory bodies and within the academic circles. This opposition led eventually to the issue of ED 47. This opposition was despite the popularity and almost universal acceptance of the "preferred approach" in SSAP 22. This was evidenced by Russell *et al*, (1989), who found that the proportion of companies which wrote off goodwill against the reserves of the consolidated group was then 95%.

The research report in Part 4 of Russell *et al* (1989), examines the rationale for accounting for goodwill and quotes McKinnon (1983) who defines it as:

The difference between the cost of the investment to the parent and the value of the subsidiary's net assets at the time the investment is purchased

(McKinnon 1983, p 65)

The goodwill debate discussed above has arisen because of a failure to identify what the accounts are trying to measure and the purposes they serve. There existed a fundamental difference in ethos between two schools of thought, which Russell *et al* (1989) called the "matching" approach and the "valuation" approach. These approaches were known as 'V-Theory' and 'T-Theory' by Hodgson *et al* (1993), where V-Theory was based on the valuation approach and T-Theory on the transactions or matching approach. The transactions or matching approach derives a realised profit from matching direct costs and all period costs against the relevant revenues of the period in question. The valuation approach, also referred to above as the 'balance sheet paradigm', takes a different perspective, and measures wealth by comparing net assets between two distinct points in time. This approach recognises the change in total wealth in terms of all gains, whether they are realised or unrealised. The approach has been supported by Edwards *et al* (1979, p.457), and is based closely upon economic valuation models. The model is the basis for all current value accounting methods and was strongly promoted in the ASB's "Draft Statement of Principles". However, although the two methods are apparently different, if the same valuation principles and theoretical assumptions are kept under both approaches, realised profits arrived at under either approach should be the same. The only difference between the two approaches is one of perspective taken. The "valuation" approach is essentially economics based, where the flow of income is being derived from comparing a stock of capital as measured between two points of time. The "matching" approach is a traditional accounting concept of determining the flow of income in order to arrive at a residual stock of capital. Solomons (1986) argued that in practice there may not be any difference between the two approaches.

For example, the difference between the capital of an entity as measured in current cost terms at the beginning and end of a specified period of time would reveal a measure of income that could be arrived at simultaneously by matching current costs to revenues within that same period. Therefore, full consistency of measurement can be achieved under both approaches as

they are fully articulated concepts, but the actual measure of capital and income arrived at must be determined by whatever concept of capital maintenance and income measurement is adopted. This can be explained with a simple example:

	Balance sheet:		**Income statement:**		
	HC	**NRV**		**HC**	**NRV**
	CU	CU		CU	CU
Opening net assets	1,000	1,500	Sales	9,000	9,000
Closing net assets	1,500	1,800	COS	8,000	8,300
			Gross profit	1,000	700
			Expenses (inc. depn.)	500	400
Net income	500	300	Net income	500	300

(Where CU = currency units HC = Historic cost and NRV = net realisable value)

The income recognised is equal to both the difference between the opening and closing net assets and between recognised periodic income and recognised periodic expenditure.
In presentation terms there are also issues concerning how the total income arrived at, is disaggregated between realised and unrealised gains, and what is the most appropriate way for these to be reported upon. The SOP deals with the segregation of realised and unrealised profits by suggesting that an artificial split between realised and unrealised gains as between the profit and loss account and the statement of total recognised gains and losses is not helpful. It is argued that this strict distinction would go against the accruals concept as it would mean that unrealised incomes shown in previous statements of recognised gains and losses would in later periods appear in the profit and loss account as and when they were realised.

To support this, the ASB stated:

> *Thus the statements of financial performance report only the gains and losses which arise in that period, and the subsequent realisation of such a gain or loss does not lead to that gain or loss being reported once more. It follows from this that where an asset changes in value or is disposed of, the gain or loss that is reported is the difference between the new value or the sales proceeds and the value previously reported.*

ASB (1995b, p.102, S 6.25)

The acceptance or rejection of the 'valuation' approach or 'realization' principle should not therefore be used as a rationale for ignoring the proper recognition and treatment of the costs contributing to goodwill. Even under the "matching" approach, within a modified historical cost system, a proper assessment of asset valuations often takes place at the end of the financial period on an *ex-post* basis because it at only this point that the profit and loss account or income statement is prepared and when adjustments are finally made. Under this system, it is usual for the values of tangible and intangible fixed assets, debtors, stocks, prepayments and accruals to be reviewed and adjusted at the year-end, for impairment or revaluation. Effectively, a "control and feedback loop" takes place where the effects of matching are constantly reviewed with respect to reported balance sheet carrying values, to ensure that balance sheet values do not become irrelevant. For example with respect to the depreciation of fixed assets, the valuation of stocks and debtors etc, provisions are used to adjust the asset values to a "true and fair" basis. This process may in some cases lead to the possibility of residual adjustments on a prior period basis. Under FRS 3 (1992) however, most of such prior period adjustments are recorded under the "all inclusive" approach within the statement of total recognised gains and losses, thereby avoiding the possibility of "reserve" accounting. Russell (1989) *et al* argued however, that the "valuation" approach is less useful

than the "matching" approach for measuring management performance. They argued that to look at total gains and losses in a period doesn't provide the best indicator of managerial performance as most unrealised gains are arguably outside the control of corporate managers. This may be true if no distinction is drawn between realized and unrealised profits in the accounts.

Clearly the "all-inclusive" position held by the ASB is that all gains and losses are declared in either the profit and loss account or in the statement of total recognised gains and losses. However, the SOP does call for a clear distinction to be made between gains and losses derived from operating activities and gains and losses made on assets held on a continuing basis. The former are reported in the profit and loss account, and the latter in the statement of total recognised gains and losses. This distinction is useful, and to a large extent meets the criteria of Russell *et al* (1989) with respect to the responsibility and control of corporate managers.

Company law in any case requires that realised profits should be separately identified in order that the protection of creditors is ensured, and to avoid the possibility of capital being repaid to shareholders "through the back door."

The recognition and measurement of purchased and inherent goodwill

All the costs associated with investing in the drivers of inherent goodwill are usually charged as period costs through the profit and loss account or income statement in the period to which they relate. As a consequence there is inevitably a time lag between the charging of the costs and the receipts of the future economic benefits. The main argument for writing off purchased goodwill directly against reserves was that it is impossible to match these costs reliably enough against the benefits received, and therefore it was considered preferable not to attempt to charge them at all. Ma and Hopkins (1988) and Russell *et al* (1989) considered this a flawed argument. They argued that it is wrong for the cost incurred in acquiring purchased goodwill to by-pass the profit and

loss account completely, because this meant that at no time was the cost of the asset contributing to future economic benefit charged against the associated benefit. This, in their view, devalued the use of the reports to users because costs within the control of management were not being included within the measurement criteria for assessing the performance of the company.

> *If purchased goodwill is written off directly to reserves one is faced with the anomaly that increments in profit arising from that goodwill appear in the profit and loss account, while the amounts paid for such increments are not charged there, so managers are not fully accountable for their actions in acquiring other firms.*

Russell *et al* (1989, p25)

Russell *et al* (1989) concluded that the control issue was the key reason why purchased goodwill should be capitalised and amortised systematically. This is also consistent with the 'Positive Theory of Agency' Altman and Subrahmanyam (1985, pp 93-131), where it was argued that accounting reports should serve to monitor the performance of management. In contrast to the current position of the ASB, Russell *et al* (1989) stated that the matching approach was the most relevant for the purpose of monitoring and motivating the financial performance of management.

When ED 47 was published originally in 1990, it was argued and recommended that purchased goodwill be capitalised and systematically amortised over its useful economic life which would have a time limit of 20 years, but which may exceptionally have been extended up to 40 years. The conceptual underpinning of the approach in ED 47 was covered in its Appendix – 'The basis of the proposed treatment of goodwill'. The appendix argued that goodwill was an asset as it met the definition of an asset as put forward by the IASC (1989). The main argument put forward was that goodwill is an asset because it is expected to contribute to future economic benefits over and above those expected from the rest of the tangible and intangible assets of the entity. ED 47, like many of the earlier contributions in the literature to the goodwill debate, described goodwill in terms of contributing to 'superior

earnings' rather than as an identifiable asset or collection of assets. As with Chambers (1966), ED 47 recognised goodwill as arising out of the fundamental difference between measuring the value of a business as a whole, and trying to aggregate the value of the separately identifiable net assets. The main argument for capitalisation as opposed to write-off was that it was more important that consistency was maintained with the treatment of other capital assets, than that there should be consistency of treatment with internally generated goodwill, as argued by Solomons (1989, pp 68-69). ED 47 stated that this argument was supported by the fact that company law also required that purchased and non-purchased goodwill should be treated differently.

However, the preference for the capitalisation of goodwill in pursuit of consistency is a subsidiary argument for its treatment. The main argument was that as purchased goodwill has a finite value and has a definite economic life it must therefore be depreciated like any other fixed asset. Opponents of amortisation of purchased goodwill argued that it was a double charge on profits. Taylor (1987) argued that charging depreciation against acquired goodwill at the same time that the company is building up inherent goodwill led to double charging the cost of goodwill against profits, and thereby to the understatement of maintainable profits within the company. He claimed that immediate write-off:

> *..treats purchased and non-purchased goodwill comparably by removing them both*

Taylor (1987, p.93)

Others followed the same line of argument, such as Ma and Hopkins (1988). However, ED 47 rebutted the argument in two ways. It argued that amortisation of acquired goodwill is not a double charge on profits as its opponents claim, because goodwill is in essence a 'free by-product' from the expenditure incurred in the continuing operations of a business to attain other direct benefits. Therefore the amortisation of goodwill is the only charge made against

the goodwill. The other argument is that goodwill has both been developed by the acquired company through its expenditure on generating that goodwill internally, and purchased by the acquiring company. Therefore as there has been dual expenditure on the goodwill, there should in effect be a double charge against the profits generated by that goodwill.

The first argument seems to be flawed, because to say that goodwill is a "free by-product" from expenditure incurred to obtain other direct benefits, is almost like arguing that sales is a "free by-product" of advertising and promotion. Surely there is no such thing as a "free by-product", and every benefit must entail a cost, however recognised or measured. The latter argument however does have some merit and can be further supported by the use of an example where a company produces its own fixed asset.

If all the expenditure in bringing the asset to its condition and location, including all attributable overheads, has been written off directly to the profit and loss account, the entity would have, *ipso facto*, under declared its profits and net asset values, under generally accepted accounting principles. However, despite the erroneous accounting, a company wishing to acquire this entity would presumably under normal circumstances need to offer a "fair market based value" for that company, including an amount to compensate the selling company's shareholders for the unrecognised fixed asset being acquired. It would go against generally accepted accounting principles to suggest that the expenditure which had been incurred previously on producing the fixed asset by the acquired company, and which had been paid for by the acquiring company, should not subsequently be depreciated normally in the acquiring company's accounts. Clearly the economic substance of the transaction is that whatever the previous accountancy treatment, an unrecognised asset has been purchased, and if this asset has a finite economic life, this should be recognised at its 'fair value' under the accruals concept as a proper charge against profits. It would seem that for the sake of consistency, the same should apply to goodwill. Therefore, it must be correct that any benefits which are eventually realised from any expenditure on acquiring goodwill should have all the costs which originally created it, charged at some point to the profit and loss account or income statement, or at least to a statement of total recognised gains and losses or to the

statement of changes in equity. The argument that profit is understated is due to the existence of a time lag between the charging of expenditure on inherent goodwill to the profit and loss account or income statement, and the eventual receipt of any future economic benefits that may be realised from that expenditure. At a single point in time, where a company is systematically investing in inherent goodwill, there may be an accumulated understatement of profit, but over the longer term, all benefits derived from the original expenditure will eventually be received and credited to the profit and loss account or income statement. Therefore, over the economic life time of any particular 'tranche' of goodwill, all costs and revenues associated with that goodwill would have been matched, although not on a strict periodic basis. On the other hand it can also be argued that immediate write-off of purchased goodwill is more consistent with the treatment of inherent goodwill but to do so seriously violates the matching principle.

> *What it (immediate write-off) does is break the relationship between reported profits and net assets, and thereby weaken the "policing" mechanism that ensures that (in the long run) aggregate reported profits will be invariant to choice of accounting methods*

Arnold *et al* (1992, p.59)

This point again highlights the issue of control and accountability raised by Russell *et al* (1989), and also the serious departure from accepted accountancy concepts. Effectively, to allow the method is tantamount to condoning 'reserve accounting', a practice that is now effectively prohibited. The other important point is that allowing this method went against the prudence and consistency concepts in that allowing acquisitive companies to write-off purchased goodwill against their reserves made them look more profitable in the long run for two reasons. Firstly as the cost of acquiring goodwill did not pass through the profit and loss account or income statement and the future economic benefits did, maintainable profits were systematically overstated. Secondly, rates of return were overstated because of the above

reason, and because net assets were being understated in the balance sheet as a consequence of the write-off. This again was confirmed in the research undertaken by Russell *et al* (1989). The report found that the overall difference in reported profits was on average 3% higher if goodwill was written off against reserves as opposed to being amortised systematically. The capitalisation approach also affected declared figures for earnings per share.

The economic reality is that the nature of the goodwill obtained may well be different as between companies growing organically and growing by acquisition. C*eteris paribus*, there is no good reason why companies should show significantly different rates of return simply because the method adopted for growth happens to differ.

With respect to the treatment of goodwill following capitalisation, Arnold *et al* (1992) recommended a system of annual review through a complex system of "ceiling" tests used to value the three components of goodwill which they identified. However, this paper made a major departure from other contemporary work and suggested that treating internally generated intangibles differently from purchased goodwill was inconsistent:

> *Capitalisation of part of purchased goodwill will result in inconsistent accounting and in an "uneven playing field" if internally created intangibles are not treated similarly. For that reason we recommend that internally created intangibles may be dealt with in the same way as purchased ones*

Arnold *et al* (1992, p.72)

This view was, at the time, an apparent quantum leap in recommended accounting treatment for goodwill, and began to challenge even the requirements of company law (CA 1985), as the existence of internally generated intangibles cannot be established from a past transaction, and may not have a verifiable cost.

However, as far as this recommendation of the Arnold *et al* report was concerned, it is noted that this door was firmly closed again in the ASB (1995b) paper "Goodwill and Intangible Assets"

> *Internally generated goodwill may not be recognised. Internally developed intangible assets may be recognised only where there is either a specific accounting standard allowing their recognition, or when they have a reliable market value obtainable from frequent transactions in a homogenous population of identical assets.*

ASB (1995b, Section 2, Paragraph 2.1.1)

The rebuttal of this aspect of the approach taken by Arnold *et al* (1992) draws from the ASB's Statement of Principles, which discusses recognition of assets in terms of external bench marking, ASB (1995a, s 4.47a and b).

Lee (1996) criticises the approach taken by Arnold *et al* (1992). The criticisms are summarised as follows:

The report ignores or overrides the main issue as to what the nature of goodwill actually is. The decomposition of goodwill into three distinct categories a), b), and c) as categorised in the paper doesn't adequately address the key issue of the 'jointness' and separateness of individual assets in an organised setting. Lee indeed suggested that goodwill could only be recognised for accounting purposes as a non-separate part of the total resources of the reporting entity:

> *That is, if future economic benefits are specifically interpreted as future cash flows and these form the basis of entity evaluation, then the conceptual impossibility of separating these flows into individual asset streams should be accepted*

Lee (1996, p.80)

Lee also criticised the fact that Arnold *et al* (1992) included little discussion of the problem of internally created goodwill, and the necessary separation of this goodwill from purchased goodwill. This distinction is explored further in Chapter 6.

It does appear ironically, as stated earlier, that the ASB paper (1995b) fell into the same trap, and could be criticised similarly for not adequately dealing with the problem of separating inherent and purchased goodwill. The ASB ignored this separation and contradicted its own assertion that inherent goodwill should not be carried on the balance sheet, by allowing 'impairment tests', by implication, to measure the recoverable amount relating to all goodwill and intangibles, not just the purchased variety. As the recognition of self-generated goodwill is still in the UK prohibited by regulation and by law, the accounting profession's position on the treatment of goodwill could be argued to be quite inconsistent as between entities growing by acquisition, where inherent goodwill may effectively be recognised through impairment testing as compared with companies growing organically where this is still prohibited.

FRS 10 and IFRS 3 are at the time of writing the latest standards prevailing in the UK and internationally, with respect to goodwill. These now firmly recommend that goodwill must only be recognised if it can be objectively and verifiably recognised from a past transaction or event. However, under these standards it is still open for companies to periodically assess goodwill for impairment and by implication to use the 'rebuttable' assumption that goodwill could have an indefinite useful economic life, therefore leaving the distinction between and purchased goodwill still extremely blurred.

Conclusions

This chapter began by exploring the purpose of financial reporting within the overall context of fundamental accounting concepts and a theoretical framework underpinning the recognition and measurement of assets, liabilities and income. From this discussion emerged

an analysis of the nature of goodwill as an asset. Reference is made to the debate taking place through the 1980s and 1990s within the accounting profession regarding the nature and treatment of purchased and inherent goodwill and how this should be recognised and measured in financial reports. The outcome of the debate was that purchased goodwill should now be recognised as an asset and either (in the UK) depreciated in a way consistent with the treatment of tangible assets, or alternatively periodically assessed for economic impairment. Within this debate emerged some confusion about the distinction between goodwill which is purchased in a verified transaction and inherent goodwill internally generated as a "going concern" incurs certain types of investing expenditure normally written off on a periodic basis to the profit and loss account or income statement. This chapter highlights that whilst generally accepted accounting practice would require enterprises to closely match expenditure to associated revenue in most situations, this is almost impossible in the case of purchased or inherent goodwill as there is no reliable way to match these costs with their associated benefits objectively. This then leads to the conclusion that by not recognising inherent goodwill whilst recognising purchased goodwill, accounting reports are likely to show serious inconsistencies between companies which grow organically as compared with those which grow predominantly by acquisition or merger understating the underlying net assets of a business.

Having examined in detail the position of the accounting regulatory bodies with respect to the recognition of net assets in general and of goodwill in particular, the following chapter now explores economic theory underlying the relationship between income, capital and company valuation.

Later, in Chapter 6, the distinction between inherent and purchased goodwill discussed in this chapter and its impact on acquisition accounting is explored through the use of a model that attempts to reconcile the recognition and measurement of all tangible and intangible assets, including purchased and inherent goodwill, within the context of other valuation paradigms.

CHAPTER 4: ECONOMIC THEORY AND THE RECOGNITION OF INCOME VALUE AND CAPITAL

As indicated in Chapter 3 above, the approach taken by the ASB in following the "balance sheet paradigm" and emphasising the nature of the integral relationship between ownership interest, net assets, and accounting gains and losses, superficially at least, may not be that different from the economic perspective.

As previously stated, prior to the 20th century, the profit and loss account or income statement, as an accounting report, was essentially secondary to that of the balance sheet. This emphasis reflects the net asset or balance sheet basis for measuring performance. The concept of measuring a stock of capital at the beginning and end of a venture or financial period was steeped in the historic 'joint venture' tradition. This probably started from the days of early commercial trading in the Mediterranean area, and through to the period in which the East India Company operated throughout the world.

The original concept of income measurement was therefore derived from the comparison of a stock of capital at the beginning and the end of the period or a venture being used as the bridge for establishing income earned within that period or over that commercial venture.

The flow of income derived from the comparison of capital measured is dependent upon the concept of capital maintenance adopted. In economics the link between income and capital is based on cash flow discounted by a rate of interest. This theory was explored by Fisher (1930) regarding the price of hiring money or interest, as the bridge built between capital and income. The concept of interest is built around the notion of "human impatience", in that a rational economic individual would prefer to consume now rather than later. In the money market place there is a continual interaction between those who have the means and the ability to delay consumption and those who have lesser immediate means and/or less

patience. Those who lend will only be prepared to do so if a premium is available to them on the amount that they eventually receive back from the borrower at some future point in time. Fisher saw the relationship between capital and income in a particular way, and made it quite clear that income was the determinant of capital value. Although the generation of income originates from a stock of physical capital goods, it is not possible to value the capital stock until the flow of income has itself been estimated and a value placed upon it. Therefore, from the stock of capital goods in physical terms, is derived the flow of income, and from a measurement of the flow of income may be derived the value of capital.

> *Income is derived from capital goods. But the value of the income is not derived from the value of the capital goods. On the contrary, the value of the capital is derived from the value of the income.*

Fisher (1930, p.14)

Fisher's view of income is quite different from those of later neo-classical economists, notably Hicks (1946). Although Fisher saw interest as the bridge between capital and income, he did not recognise changes in capital (caused by changes in expectations about the future prospects of income) as having an impact on the measurement of income in the current period. Fisher saw income as being the psychic pleasure of consumption, which he called 'enjoyment income'. As this is difficult to measure, he argued that this income could be explained by identifying the goods and services which gave the enjoyment, described as 'real income' and measuring the cost of these goods and services consumed. The assumption being that the prices of goods and services were arrived at in accordance with classical marginal utility theory. The contentious part of this theory was that 'real' or 'enjoyment' income according to Fisher could exceed the 'money' income received by the individual. In other words, an individual could borrow to consume, and as a consequence his income would be higher. This view of income is a strange one, as it is difficult to accept that borrowing can increase income while saving reduces it.

Hicks however, developed the relationship between capital and income further and discussed it in a real world context, where rates of interest are likely to fluctuate and expectations about the future could be revised in the light of new information. Unlike Fisher he saw income measurement, not simply in terms of consumption including borrowing ('dis-saving'), but as a flow of future benefits discounted by a rate of interest and adjusted for changes in capital, thus introducing a clear concept of income in terms of a capital maintenance concept. Hicks explained that changes in capital due to changes in interest rates and expectations about the future should be excluded from current income measurement. This basic economic philosophy of income is consistent with the current position of the ASB as set out in the Statement of Principles (1999), and the adoption of the 'all inclusive' approach, where income is calculated on the basis of changes in the capital position of the entity between two periods of time.

Hicks and other contemporary economists including Lindahl (1938) explained the value of capital (or assets as the accountant would call them) in terms of a future flow of cash benefits representing the potential consumption of an individual. These flows are then discounted by an appropriate "interest" rate applying to the cost of borrowing that money today. The economist's concept of capital maintenance would be based on consuming only as much cash received in a period as would leave the individual as well off in terms of the real value of capital at the end of the period, as they were at the beginning. Hicks (1946) defined income as follows:

> *The purpose of income in practical affairs is to give people an indication of the amount which they can consume without impoverishing themselves. Following out this idea, it would seem that we ought to define a man's income as the maximum value which he can consume in a week, and still be as well off at the end of the week as he was at the beginning.*

Hicks (1946, p. 172)

The real value of the capital, as opposed to the nominal or monetary value, would be based on a straight comparison of the discounted cash flows expected as at the two points in time. The income measure derived is known as economic income, and the relationship between it and capital is as follows:

$$Ye = C + (Kt - Kt\text{-}1)$$

Where: Ye = ***Economic income for the period***

and: C = ***Net realised cash flows in the period***

Kt = ***Capital at the end of the period measured in terms of the net present value of future cash flows expected from that time on.***

$K(t\text{-}1)$ = ***Capital at the beginning of the period measured in terms of the net present value of future cash flows expected from that time on.***

Therefore the individual may only consume as much of C in any one period as not to deplete the value of Kt as at the end of the period as compared with Kt-1 at the beginning of that period. In order to maintain the capital at its real value it would be necessary to re-invest the shortfall in an investment earning a rate of interest equal to that used as the discount factor. As expectations change throughout the lifetime of the investment however, windfall gains and or losses may be experienced which need to be taken into account each period. These windfalls known also as subjective goodwill (Edwards and Bell, 1961) would either mean that additional or lesser amounts of C would need to be invested to maintain capital as compared with that expected at the beginning of the period.

Hicks (1946) drew the distinction between economic income *ex ante* and economic income *ex post* in that economic income is calculated with information available at the beginning of the period under the *ex-ante* model but with information available at the end of the period under

the *ex-post* model. Clearly from a pragmatic point of view, in order to maintain capital properly, an *ex ante* perspective is best taken because decisions on appropriate levels of consumption for an individual would need to be made at the beginning of a period rather than at the end. However for a business which makes its major distribution decisions at the end of a period, the *ex post* perspective is quite appropriate, because in practice companies prepare their accounts at that time and do so in the light of the information that they have then. This includes information available to them on the current value of their net assets and of the actual realised income earned for that period. Thus, if a company were to adopt the present value model of accounting, it would mean that the company could assess its closing capital in the light of expectations about future cash flows and cost of capital changes available to it at the end of the financial period. A company's 'economic income' would represent its realised cash profits ('money income'), plus or minus any change in the capital measured as at the beginning and at the end of the period, with information available at the end of the period. In effect, economic income is the excess over and above the amount of money income required to be re-invested to maintain the real capital of the company. Following on from this a company would need to make a prior period adjustment for any subjective goodwill or 'windfall gains or losses' caused by changes in expectations as between one period and the next. Given current thinking in financial reporting these might be most logically passed through the statement of total recognised gains and losses, under the UK's financial reporting system, or through the 'statement of changes in equity' under international financial reporting standards.

The economic approach to income and capital valuation is best illustrated with the use of an example:

As at time t0, a company which is expected to maintain a constant cost of capital of 8% expects to make the following cash profits over the next three years:

Period t0 - t1 £4,000; Period t1-t2 £6,000; Period t2-t3 £8,000 and at the end of the third period (t4) it was expected that the company would be acquired as a whole entity, for a sum of £12,000.

However as time passes the expectations about the future change as follows:

At t2 £6,500 profits are declared but despite this performance, and because of fears about the economy, expectations of future cash flows are revised as follows: At t3 £7,000; and the anticipated selling price at t4 £11,000
At t3 £7,500 is actually received and as a result expectations of future cash flows are again revised as follows:
Take-over price at t4: £11,500.

At t4 the company is subject to a 100% take-over at an actual price of £10,800

Under Hicks' economic income model calculated under the *ex-post* perspective, economic income and capital valuations at the end of each period would be as follows in Table 1.

Table 1: Derivation of Economic Income

Time period:	**Cash flows (C)**	**Present values (Kt)**	**Present values (Kt-1)**	**Economic Income (Ye)**	**Windfall (w)**	**Total return: (Ye + w)**	**Re-investment (C- (Ye +w))**
	(£)	**(£)**	**(£)**	**(£)**	**(£)**	**(£)**	**(£)**
1	**4,000**	21,940	24,018	1,922	Nil	1,922	2078
2	**6,500**	15,912	20,752	1,660	(1,188)	472	6028
3	**7,500**	10,648	16,804	1,344	892	2,236	5264
4	**10,800**	Nil	10,000	800	(648)	152	10,648
Totals:	**28,800**			**5,726**	**(944)**	**4,781**	**24,018**

*These are calculated by discounting the future cash flows (as expected at the beginning of each period) by the prevailing discount rate or rate of interest. For example the opening capital at t0 = 4,000/ (1.08) + 6,000/ $(1.08)^2$ + 8,000/ $(1.08)^3$ + 12,000/ $(1.08)^4$ = (3,703 + 5,144 + 6,351 + 8,820) = £24,018

The capital calculations at the beginning and at the end of each period are carried out by taking the net present values of all future cash flows as expected at the end of each period in accordance with the *ex post* perspective. The initial "economic income" is derived by taking the realised cash flow in the period and adjusting it by the difference between opening and closing capital. It is also derived by multiplying the opening capital by the discount factor.

The difference between realised cash flows in a period and the economic income should be re-invested at the prevailing rate of interest in order to maintain the capital at its previous level. As expectations about the future change in each period, there will be a discrepancy between closing capital as worked out in the prior period, and opening capital as calculated in the current period. This difference is treated as a windfall gain or loss or 'subjective goodwill' and must be treated as a prior period adjustment to the current period's income, before arriving at the true 'economic income' for the period. This model raises many questions for the treatment of gains and losses in accountancy and links to the current accounting treatment of assessing the value of purchased goodwill through periodic impairment tests. Each capital calculation made takes into account the future cash flows expected and the expected interest rate applied as a discount factor. The cash flows anticipated, would include by implication, all benefits expected from the productive deployment of tangibles, intangibles, and from the synergistic benefits of their use in concert. Therefore the economic valuation model, although highly subjective, gives a pure valuation model for a business, and included in the capital valuation carried out on a systematic basis would by implication be the carrying value of all purchased and inherent goodwill.

It is important at this stage to analyse by way of contrast what constitutes the stock of capital as measured at different points in time with reference to a financial reporting model. As already stated, capital is the stock from which the flow of income is derived.

The economic model estimates the total flow of future income and discounts them, but the model doesn't attempt to break down the total flow of future income and relate these constituents of income with their specific and separable units of capital. The accountant on the other hand wishes to recognise capital, or net assets, as identifiable constituents as far as generally accepted accounting principles would allow. The accountant will therefore equate capital to a collection of tangible net assets and to some strictly verifiable intangibles as measured in monetary terms. The reason for the existence of goodwill in the accounting model, where it isn't separately identified under the economic model, is due to the measurement and recognition limitations of current accounting practice, including the effect of timing differences.

In summary, the difference between the accounting and the economic model is the perception of capital and its relationship with income. As the accountant starts, in Fisher's terms, 'upstream' and looks 'downstream' it is difficult to provide a valuation of assets without a consideration of income. Therefore, the accountant attempts to value his stock of capital, (net assets), without normal reference to the measurement of future income, which Fisher explains was essential in his sequence of capital valuation (Fisher, 1930, p.15).

The economic model subsumes most of the accounting residual known as goodwill through its forward looking perspective and by capitalising unrealised but anticipated future cash flow gains. The model only completely eliminates goodwill however, in the unreal situation where expectations made about the future don't change under what is known as the *ideal* income (*ex-post*) model. When expectations about future cash flows change between the end of one period and the beginning of the next are built into the valuation, "windfall gains" or "subjective goodwill" must be recognised. However, whilst the economic model seems to take account of inherent goodwill either through expectations remaining constant or through the recognition of "windfalls" as they arise, if a company buys another company, there may

well still be a difference in the value placed on or price paid for that business due to differing perceptions of the net future cash flows expected, as between the existing owners with respect to their plans, and the prospective owners with respect to their own plans. Therefore, even under the economic model a problem may well still arise with respect to purchased goodwill. Hicks explained this temporary disequilibrium, as he called it, in the following way:

> *It remains true that income is a subjective concept dependent on the particular expectations of the individual in question. Now, as we have seen there is no reason why the expectations of different individuals should be consistent; one of the main causes of the disequilibrium in the economic system is a lack of consistency in expectations and plans.*

Hicks (1946, p.177)

The theoretical economic model therefore assumes that income is measured from an all-inclusive measurement of capital, discounting all future cash flows anticipated to flow into the organisation. The valuations arrived at will in practice vary from period to period, depending upon the latest expectations and plans of those who control the business. In accountancy however, income is measured traditionally; on the transactions basis, adhering to the twin concepts of historic cost and realisation. However, as Lee (1985) states quite clearly:

> *Overall, therefore, total accounting income equals total economic income, if windfall gains are added to the latter figure. But the main difference in the periodic figures is the recognition of unrealised changes in capital value only in the economic model.*

Lee (1985, p 63)

Essentially Lee sees the difference between the two models as one of orientation. The accounting model is a backward looking *ex-post* model, whilst the economic model is an *ex-ante* or predictions based model. The accounting model will recognise gains only when they

are realised, while the economic model recognises unrealised gains as and when they accrue. The goodwill problem therefore could simply arise through the stock market using the economic model for valuation, while the accountant uses a completely different perspective. If this is true, there may always be a timing difference between values based on unrealised expectations and the eventual realisation or not of those expectations, leaving a permanent goodwill residual to account for.

In practice therefore, the accounting model, which also attempts to measure capital, uses a different valuation basis for this measurement. Traditionally, the accountant will value not the total future income, but measure the cost of the specific resources anticipated to produce that income, and in so doing ignores the fact that the historic cost may not be representative of the current value in use of the resource concerned. To do so would entail an assessment of a combination of current circumstances and expectations of the entity about its future, and the extent to which any particular unit of resource has had its economic life depleted. However, the alternative measurement basis underlying accounting and economic theory is not the only reason for a difference in the measurement of capital. To some extent, many other economic resources are not being recognized under the accounting model, such as some intangibles and other sources of what constitutes accounting goodwill. This is because many costs written off under the "matching principle" relate to investment in new resources, which under the traditional accounting measurement system are not recognised as assets or as components of the capital being measured on reliability or objectivity grounds. Thirdly, there is the problem of synergy. The traditional accounting system of historic cost measurement and even current value accounting, cannot take into account that assets used in combination, or the productive capability of the organisation as a whole, may be greater than can be disaggregated or separately attributable to single units of identified resources. Finally there is the problem of wider influences on value not specific to the company itself, such as political, fiscal, financial and other macro economic factors. At present these influences on value only play a minor role

in the accounting model, whilst under the theoretical economic model they are an integral part of the calculation of income and capital.

Lee (1996) emphasises the importance of making a full and complete measurement of capital and the inability of the accounting system to do so:

> *This means, so far as income is concerned, it is important to measure capital fully - i.e. that its value takes cognisance of all economic resources which contribute to the existence of income. However, if the historic cost and current value income models are examined, it is clearly seen that that the relevant capital computations are incomplete, and that in most situations the capital of the business entity is computed on the basis of an aggregation of resource valuations which have arisen from past transactions or events. This means that significant business resources may well be omitted from the relevant capital and income computations e.g. goodwill and other intangibles, which are often created rather than acquired by the entity.*

Lee (1996, p 163-164)

This passage makes it quite clear that even if accountants were to adopt systematic current value accounting models, there would still exist a significant under-measurement of the capital of an entity, not just through over conservative accounting, but due to several other factors leading to non-recognition of economic resources. Harvey and Keer (1978) discussed the relationship between capital and income and point out that included in capital is human capital, from the work of Fisher (1930).

> *Capital is a stock of wealth existing at a given instant in time; a flow of benefits from wealth through a period of time is called income. Capital, including human capital, is a stock of wealth which generates income.*

(Harvey and Keer, 1978, p.34)

This indicates that one of the differences between the economic perspective and that of accountants may be the inclusion or exclusion of human assets within the stock of capital, probably to be included as unrecognised intangibles within the accounting model.

The crux therefore, of the difference between the accounting and economic view of the value of goodwill, is that the accountant treats it as a residual measure after accounting for tangibles and certain intangibles as identified under generally accepted accounting principles, normally adopting the cost based realisation perspective. On the other hand the economist looks at the problem of valuation from a holistic income perspective. The economist would attempt to measure the value of the business as a whole, by discounting the future stream of cash flows accruing to that entity and all influences on that cash flow stream both internal to the entity and wider environmental influences. The economists therefore argue that measurement of assets is secondary to the measurement of income. Income is the starting point for valuation and a measure of capital is the by-product of that measurement. Fisher puts this argument in a nutshell:

> *In whatever ways the ownership be distributed and symbolized in documents, the entire group of property rights are merely a means to an end - income. Income is the alpha and omega of economics.*

Fisher (1930, p 13)

Paton (1973), in support of this view argues that it is the enterprise as a whole, and not individual assets that determines profits:

> *The business enterprise, not the particular facility, is the essential unit in terms of which business income blooms it is the enterprise not the individual asset which produces profits*

Paton (1924, p392)

He goes further and describes the hopelessness of attempting to value a business in terms of the specific facilities or net assets held:

> *The gap between enterprise income in a particular period and individual contributing factors is too wide to be bridged by any scheme of accounting, however elaborate. And even were this problem to be met successfully, it would still leave us with the difficulty of estimating the future incomes of specific factors*

Paton (1924, p. 391)

Conclusions

This chapter has explored the fundamental economic valuation model and has compared this approach with that of the traditional accounting approach. This analysis has served to explain that goodwill as exists within the accounting model is implicitly built into the capital valuation within the economic model when "windfall" gains are taken into account.

Despite the alleged hopelessness of trying to relate the value of separable net assets including goodwill to their associated income streams, many writers have attempted to apply the theoretical relevance of the economic model into the accounting area in order to increase the relevance of traditional accounting.

Some of these applied accounting valuation models will now be discussed in Chapter 5, in particular the whole area of residual income and how this and other related models specifically attempt to reconcile the economic and accounting models in a feasible way.

CHAPTER 5: RESIDUAL INCOME AND OTHER HYBRID VALUATION MODELS

Introduction

The economic analysis of income and value has been developed throughout the 20th century. The main contributors in the economics literature relevant to the main subject of the thesis are Fisher (1930), Lindahl (1939) and Hicks (1946). As explained in Chapter 4, Fisher and Hicks developed concepts of income for individuals that could be applied to companies. Lindahl devised the concept of income as interest (or as an opportunity cost of foregoing present consumption). He, and later Hicks, developed the notion of income *ex-ante* and *ex-post* and the impact of unexpected changes of future cash flows on wealth. In Chapter 4 any unexpected changes in wealth between the beginning and end of the period were described as 'windfalls'. It was argued by Hicks that windfalls should be excluded from the measurement of income. Hicks' real contribution to this area was his notion of the maintenance of capital as a guide to consumption. The other aspect of Hicks' concept of economic income was the idea that income can therefore only be recognised after the cost of capital has been deducted - the notion of the opportunity cost of supplying capital. This is where the development of a model for valuation takes us next. As Hicks argued, income for consumption cannot be identified unless the implicit cost of supplying the means to earn that income (the stock of capital) has been covered. Therefore real income is the residual amount available to the individual or owners. Traditional accounting models however, declare profits on the realisation basis and from a historical perspective and take no account of the opportunity cost of investing long-term funds, or indeed any expectations about the future that are so crucial within the economics model.

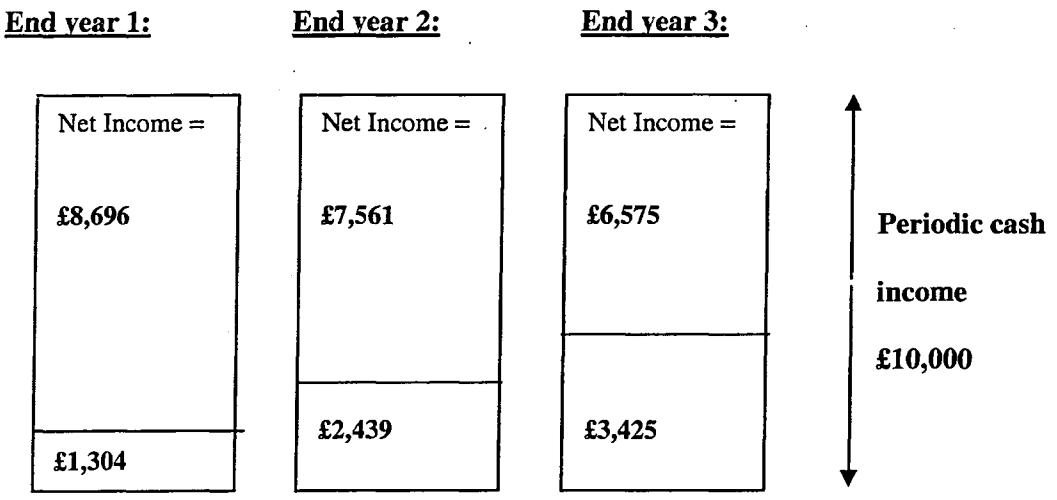
When placing a value on a business, economic theory would argue that the capital value of the investment is equal to the discounted sum of all incomes generated in the future from that

stock of capital – this is Fisher's (1930) circularity argument, where income = capital and capital = income.

The discount factor to apply is the opportunity cost of investing in this stock of capital as opposed to another stock of capital offering the next best alternative investment. So the value of the stock of capital can only be measured in terms of the income it can generate (net of the cost of supplying that capital to this investment).

This can be shown in Figure 1, where it is assumed that income from an investment is to be constant at £10,000 for the next three years and where the investment becomes worthless at the end of the third period. The investors have paid £21,000 for the investment.

Figure 1: – Breakdown of the value of an investment in periodic terms assuming an opportunity cost of 15%



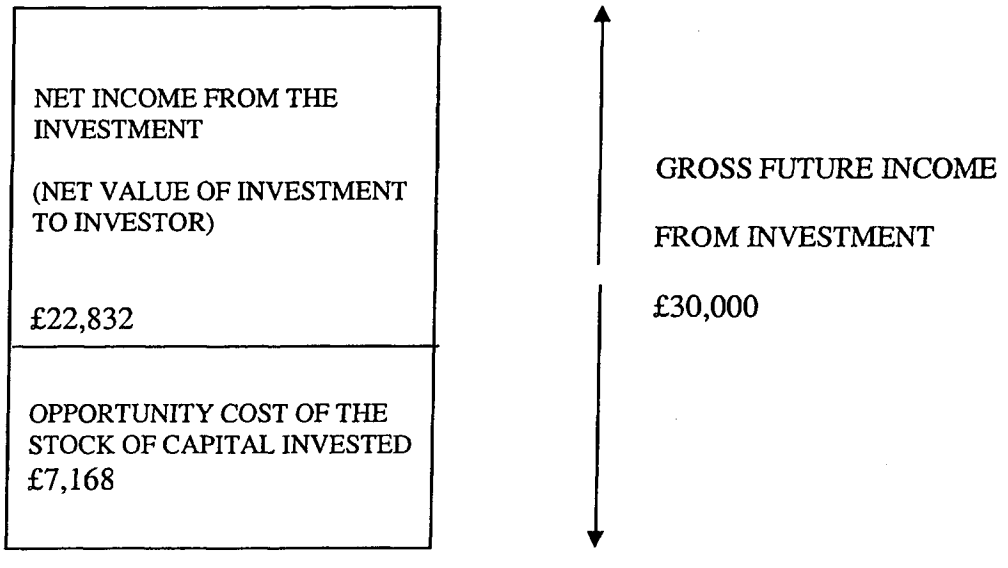
By purchasing the investment at the beginning of year one the investor has given up the right to consume goods to the value of the investment made and instead has to wait until income from the investment purchased is realised at the end of each of the three years. Economic theory states that by deferring his consumption, the investor has foregone the right he might otherwise have had to receive and consume that amount immediately.

For this sacrifice Lindahl (1939) would argue an interest has to be paid. For example receiving £10,000 in one year's time is the same as receiving (10,000 x 1/1.15) £8,696 immediately because that sum invested at 15% for a year would yield £10,000 by the end of the year i.e. (8,696 x 1.15) = £10,000.

Clearly the investor has to wait even longer for the £10,000 sums receivable at the end of the second and third years so the opportunity costs of those incomes in real terms are even greater. The net present values of these sums are calculated as follows: Year 2 ($1/1.15^2$) x 10,000 = £7,561 and from the end of Year 3 ($1/1.15^3$) x 10,000 = £6,575.

In Figure 2 below, the periodic net incomes in Figure 1 are aggregated so as to arrive at a theoretical economic valuation for the total investment. This is achieved by adding the discounted net incomes from periods one, two and three (8,696+7,561+6,575) = £22,832. The opportunity cost of having to wait for these is simply the difference between the gross cash receipts obtained from the investment and the net present value of these cash receipts.

Figure 2: Breakdown of the value of an investment in total terms



As can be seen above, the net value of the investment therefore is equal to: (total future income – opportunity cost of capital invested). The value of the investment consists of periodic future incomes net of the periodic opportunity costs of deferring consumption from the present to the time that the income is eventually realised.

Clearly, to assess whether the investment creates wealth for the investor in this case will depend upon how much the investor has actually paid for the investment. The decision rule is that if the investor paid anything less than £22,832 for the investment they are better off by the difference, and if they paid any more than £22,832, they would be worse off by the difference. In this case the investors had paid £21,000 so that in present value terms they were enriched by £1,832 through making the investment.

Reconciling accounting models of income and value to economics

As explained in the previous chapter, the differences between accounting and economics are fundamental. The concept of historic cost and realisation requires that accountants should not recognise distributable profit until it is realised. Therefore under generally accepted accounting practice (apart from recognising long-term asset revaluations in the Statement of Changes in Equity or in the Statement of Total Recognised Gains and Losses) the value placed on the business is equal to the originally invested capital plus all realised profits and capital introductions, less any capital withdrawals or redemptions. However, in economic terms, value is based, not on realised income, but on expected income for the foreseeable economic life of the entity discounted to its present value taking into account the opportunity cost of investing. Valuing companies from these two quite different perspectives is likely to give very different results and in normal circumstances would lead to the accountant understating value as against the economist, perhaps explaining why prices paid for acquired companies often exceed their accounting book values and why significant levels of purchased goodwill so often need to be recognised on acquisition.

The first economist to try and reconcile the idea of commercial profit to economic principles was Alfred Marshall (1920), who recognised that to determine pure profit, the opportunity cost of the owner's capital must be recognised as a cost to the business.

This very early attempt to link economic principles to accounting profit was developed under the more common name of 'residual income' during the 20th century. The concept of residual income (RI) was promoted by Solomons (1965) applied in the context of evaluating divisional performance and in measuring returns on investment.

Another significant contribution to the area of reconciling the economics of valuation and income to the accounting context was by Edwards and Bell (1961). They provided one of the earliest and most influential expositions of the use of accounting data for the purpose of valuation. They concluded that the main objective of management must be to maximise the present value of the stream of RI, first used as a term by the General Electric Company in the United States. This seems obvious in that the greater the stream of RI, the greater the value of the company net of the opportunity cost of supplying the invested capital to that business.

This is shown in the following equation:

$$\mathbf{G_t = E_t \sum^{N}_{t=1} (R_t/(1+k_e)}$$

Where: G_t = Present value of future residual income

And: E_t = Expectations from t=1 to t=N

R_t = Returns at time t (where t = 1 to N)

k_e = Cost of equity

Essentially this equation mathematically represents what was explained in Figures 1 and 2 above. The total value of the firm is the same as the sum of all expected periodic returns

discounted by the opportunity cost to shareholders of investing in the next best alternative investment of comparable risk.

However the concept of RI or 'economic profit' as originally coined by Marshall (1920) is used slightly differently in an accounting context.

This can be explained using the same example as shown in Figures 1 and 2 above, where the company earns £10,000 of operating profits after tax for the period on £21,000 of invested capital. The cost of equity (Ke) is estimated at 15%. The nominal rate of return = 10,000/21,000 = 47.62%

RI/economic profit is equal to invested capital x (return on equity capital – Ke)

Therefore economic profit is 21,000 x (47.62% - 15%) = £6,850

This can also be calculated for one period as follows:

		(£)
Operating profits after tax:		10,000
Less; Capital charge	(21,000 x 15%)	3,150
Residual income:		6,850

The use of RI as a valuation tool can be demonstrated by extending the example. If it is assumed that the company expects to earn £10,000 into perpetuity, rather than just for three years, as in the original example, then using the perpetuity model, the £10,000 can be discounted as follows, giving a value for the company of (10,000/0.15) or £66,667. Under RI and utilizing the clean surplus concept where the profit earned net of opportunity cost is discounted into perpetuity (Preinreich, 1938), the £66,667 can be broken down as follows:

	(£)	
Clean surplus earnings discounted into perpetuity	(6,850/0.15)	45,667
Invested capital		21,000
Total valuation of company:		66,667

This is a different way of looking at the valuation of a company and this approach will be re-visited when a testable model for assessing the effect of cash flows on corporate valuation in Chapter 8 is developed.

In the economic model, the invested capital was simply used as a benchmark to gauge whether the intrinsic value of the company exceeded the amount invested, indicating whether a windfall had been made or not. Similarly in the above example, the total value of the company is broken down into two separate components, the invested capital and the discounted future income less a charge for the use of that capital invested. The total value is divided between the amount invested and a residual value (if a premium) created by earnings being in excess of the cost of capital required to compensate shareholders for investing in the company. However, the same total valuation is more directly derived holistically by discounting the gross cash flows using the perpetuity model (10,000/0.15) = £66,667. This point will be explored further at the beginning of Chapter 8.

The RI (net of the capital charge) is also known as the 'clean surplus' and the clean surplus relation (CSR) is the notion that the value of the company should always be equal to the book value of invested assets plus the discounted RI after charging for the use of this capital. Traditional accounting profit makes no such charge for the implicit use of long-term funds.

To summarise, the difference between the accounting and economic concepts of profit Solomons (1965) explained how accounting profit and economic profit could be reconciled as follows:

Accounting income

+ (Unrealised changes in the value of tangible assets having taken place within an accounting period, over and above value changes recognised as depreciation or stock write-offs)

- (Amounts realised in the current accounting period in respect of changes in tangible assets having taken place in previous periods and not recognised in those periods)

+ (Changes in the value of intangible assets during the period including goodwill)

- (Amounts realised in the current accounting period in respect of changes in intangible assets or goodwill having taken place in previous periods and not recognised in those periods)

- (Opportunity cost of supplying long-term capital to the business by investors)

= Equals economic income

Basically the two models are only fully reconciled if all the above adjustments are made. For example unrealised changes in the value of tangibles cannot be included in traditional accounting profit, but would be recognised as a windfall gain in economic profit. Note however that such gains can be separately declared as income in the statement of changes in equity under international GAAP or in the statement of total recognised gains and losses (STRGL) as required under FRS 3 in the UK. The other key aspect here is the consideration of timing differences associated with the previous point. Whilst the economic model would recognise the unrealised gains as they arise there would be no need to recognise the realised gain in later periods so as to avoid double counting. In addition, changes in the value of intangible assets and goodwill due to changes in expectations about earnings in the future would not be recognised contemporaneously in the accounting model until realised, causing

significant timing differences between the accountants' basis of value and that of the economist.

Other derivatives of the clean surplus measure of profit have also been promoted under the name of Earned Economic Income (EEI), debated in the mid-nineteen nineties by amongst others Skinner (1993) and Peasnell (1995), but these are again based on the same basic concept.

Applied financial management models of measuring income and value

During the 1980s and 1990s academics and practitioners in the financial management field explored the area of valuation metrics and created a whole new discipline known as "Value Based Management".

MVA/EVA - Shareholder value

G Bennett Stewart III's book "The Quest for Value" usefully links the accounting and economic models and attempts to bridge the main differences. Essentially the 'market value added' (MVA) of a company is the market value less the 'economic book value' (EBV) invested. Economic value added (EVA) is the difference between the "free" return on capital invested, which is 'net operating profit after tax' (NOPAT) less the 'weighted average cost of capital' (WACC) x EBV.

The MVA of a company is arrived at by discounting all future EVA. EVA as a performance measure was first advocated by Stewart (1991) and was derived as an applied version of the 'residual income' concept. The concept of EVA is that income should only be recognised after a charge has been made for the cost of using all sources of capital employed in generating these earnings. This concept recognises, as do all clean surplus models, that there is an implicit opportunity cost faced by investors when they invest in a business, being the foregoing of immediate consumption from the next best alternative rate of return available

immediately from another investment opportunity. Effectively the system recommends that management accepts all projects giving a positive return after allowing for all costs (including the cost of capital), and rejects all projects that produce a negative return. This residual income measure named NOPAT by Stern and Stewart, is defined as profits from operations after depreciation and before financing costs and non-cash bookkeeping entries. In other words NOPAT is broadly equivalent to a free cash flow less depreciation.

The non-cash bookkeeping entries recommended by Stewart (1991) and known as equity equivalents, effectively undo some of the accruals based accounting adjustments, partially converting profit to cash flow, and through grossing up or netting down book value to what is known as 'economic book value' (EBV). Up to 164 such adjustments may be possible, but in practice only 15 or so are considered significant in most cases (Stewart, 1994). The main adjustments considered necessary include the unwinding of deferred tax provisions, provisions for stock valuation, provisions for unrealised profits, bad debt provisions, amortised goodwill, research and development and other intangible assets, restructuring and other accounting write-offs. Stern et al (1995) also recommend that the present value of operating lease payments may need to be adjusted for, because this type of expenditure can in reality constitute a recognisable asset. Stern and Stewart argue that both NOPAT and EBV should be modified with respect to the above adjustments, in order to produce both income and capital numbers which are based more firmly on economic reality than upon accounting convention. Stewart then argues that if the weighted average cost of capital (WACC) is subtracted from NOPAT, an economic measure of income known as EVA is arrived at. They also argue, correctly, that the net present value of all future EVAs constitutes the difference between EBV and the theoretical market value of the shares or the company.

Stewart's (1994) EVA concept and the Hicks (1946) notion of 'economic income' discussed in Chapter 3 are both derived from cash flows less the cost of capital based on the remaining invested capital as measured at the beginning and end of each period. Under the Hicks (1946) model, the individual is assumed to consume a maximum amount from their annual cash

inflows received without impairing their capital employed as between the beginning and end of a period, known as 'economic income' (Ye). There is no concept of capital accumulation where the originally invested capital may be increased through retentions. On the other hand, a company would generate EVA where it produces "net profits" in excess of what is required to meet the cost of capital employed, or which in other words provides a positive NOPAT, discounted at the appropriate 'hurdle rate' i.e. WACC.

The essential difference between the EVA model and the economic model is the perspective taken. Hicks' (1946) economic income is taken from the personal perspective whilst EVA is taken from the entity perspective. From an entity perspective, there is often the situation where residual income is retained within the business leading to a capital accumulation process rather than merely a capital maintenance one. Therefore, linking the two models, under the Hicks model *the cost of capital is the economic income*, i.e. what may be consumed by the individual after maintaining the capital stock, namely interest while EVA is the cash earnings (NOPAT) less the *economic income* essentially being equivalent to the amount an individual or an entity would have to re-invest internally or externally per period to maintain the market value of the investment.

Where the entity does not 'consume' or distribute this surplus, the EVA is cumulatively added to the originally invested capital. Inevitably therefore, as the level of invested capital in this situation is increasing, the amount subsequently needed to be re-invested becomes all the greater (*ceteris paribus*) in order for it to be maintained. These surpluses discounted at the appropriate discount rate give the true MVA as at any point in time.

Using the data used earlier in Figures 1 and 2 it is now possible to link economic theory and the concept of residual income or 'clean surplus' accounting with EVA theory with this highly simplified model.

This is now presented in Table 1 below, using the same 15% discount rate, based upon the calculations of *ideal income ex-post* where perfect knowledge of the future exists when the investment was originally undertaken and assuming the investment is expected to realise cash profits of £10,000 each year for three years:

Table 1: EVA model

Time periods: (t)	**Cash flows (C)**	**Economic Book Value (Kt)**	**Economic Book Values (Kt-1)**	**Cost of capital (Kw)**	**EVA**	**MVA**	**MV**
	(£)	**(£)**	**(£)**	**(£)**	**(£)**	**(£)**	**(£)**
1	**10,000**	16,257 (b)	22,832 (a)	3,425	6,575	6,575	22,832
2	**10,000**	8,696 (c)	16,257	2,439	7,561	14,136	22,832
3	**10,000**	Nil	8,696	1,304	8,696	22,832	22,832
Totals:	**30,000**			**7,168**	**22,832**		

Present value of the cash flows =

(a) $10 \times (1/1.15) + 10 \times (1/1.15^2) + 10 \times (1/1.15^3)$ = £22,832

(b) $10 \times (1/1.15) + 10 \times (1/1.1^2)$ = £16,257

(c) $10 \times (1/1.15)$ = £8,696

- Economic Book Values (EBV) equal the expired economic values of the original investment at different points during the economic life of the investment.
- Economic Value Added (EVA) is (C - (Kw x EBV) where Kw is the weighted average cost of capital or opportunity cost.
- Market Value Added (MVA) is the difference between the market value of the investment at the end of the period and its EBV
- Market Value (MV) is the total theoretical market value at the end of each financial period.

- (MV is therefore equivalent to the EBV at the year-end plus the accumulated EVA to date.)

It can therefore be seen as stated above that in the Stewart model, (1991) the MVA at any point in time is also equal to the cumulative EVA earned to date.

Note that as the anticipated cash flows expected are eventually realised, the economic book values of the original non-monetary investment falls. This means that just to maintain the originally invested capital the difference between the realised cash flows and the required rate of return on the capital at the beginning of any period must be re-invested *in an alternative internal or external investment attracting the same rate* for the investment in total to be at least maintained in real terms. From the perspective of the individual investor that Table 1 in Chapter 4 originally related to, the investors themselves are expected to re-invest the funds in an alternative investment and consume the economic income (Ye), which from the perspective of the company is known as the equity cost of capital or (Ke). From the perspective of a business entity however, the business itself would be expected to retain these amounts and use them to earn the required rate internally in alternative projects. Under the perfect model discussed above, the market value (MV) of the investment at the time of acquisition is the same as the present value of the future cash flows expected from the asset, and therefore no market premium ever arises, (assuming a highly efficient market).

From the above models it is important to note that the original assets invested in have a finite economic life. In the case of the individual buying a share in the circumstances described, the value of the share itself is inexorably falling as the cash flows it produces are gradually realised, but the total capital fund invested by the shareholder remains intact through a gradual transfer of the funds obtained from the original investment to an alternative one. The same is true for a company's assets. Those assets purchased in the first place will always have a finite economic life, and unless some of the cash flows realised from their use are re-

invested elsewhere, then it may be impossible to maintain the original value of the investment from the point of view of the company's owners.

EVA as a performance measure

The initial MVA calculation under the EVA model is nothing more or less than the net present value of the company based on traditional discounting techniques. This is because, assuming that EVA is equal to free cash flow less depreciation, the net present value of all EVAs must give the MVA by a mathematical inevitability. This is, *ceteris paribus,* equivalent to the difference between the EBV and the MV of the business. In effect the MVA is a stock measure as is NPV. The advantage of the EVA model, according to its advocates, is that EVA is a flow measure, and is therefore useful in measuring the periodic performance of a business and its management. However, because EVA is a measure net of accounting depreciation and other non-cash accounting based adjustments, the undiscounted EVA figure is heavily dependent on the allocation method adopted. Therefore, although in overall terms the equivalence between MVA and NPV is irrefutable, the value of the periodic EVAs arrived at under the model may be called into question. This can be explained through using the same illustration running through this chapter once again:

The company is set up at time t0 with £21,000 share capital, which is expected to generate net cash flows of £10,000 at t1, £10,000 at t2 and £10,000 at t3. 25% straight-line depreciation is charged against profits at t1, t2, and t3. The weighted average cost of capital (Kw) for this company is 15%. (See Table 2)

Table 2

Point in time	NOPAT (£'000)	EBV (£'000)	Depreciation (£'000)	Kw (£'000) EBV x 15%	EVA* (£'000)
t0		21			
t1	10	14	7	3.15	**- 0.15**
t2	10	7	7	2.1	**+ 0.9**
t3	10	0	7	1.05	**+1.95**

EVAs = (net cash flow - depreciation - cost of capital)

Present value of EVAs (MVA) = -0.15 x (1/1.15) + 0.9 x ($1/1.15^2$) + 1.95 x ($1/1.15^3$)

= £1,832

The investment is therefore worthwhile and should be undertaken, but value is destroyed at t1 when a negative EVA is reported.

Should management be held responsible? It seems not because the overall investment is one that has enriched the shareholders by £1,832. This was the same result as was obtained when a positive net present value of £1,832 was calculated in the original example worked through in Figures 1 and 2. The negative EVA reported at t1 is entirely due to the allocation of accounting depreciation against the cash flows realised.

If, for example, the sum of the digits (3/6, 2/6, 1/6) method of depreciation were adopted, how would this affect the reported EVAs? (See Table 3)

Table 3

Point in time	NOPAT (£'000)	EBV (£'000)	Depreciation (£'000)	Kw (£'000) EBV x 15%	EVA* (£'000)
t0		21			
t1	10	10.5	10.5	3.15	**- 3.65**
t2	10	3.5	7	1.575	**+1.425**
t3	10	0	3.5	0.525	**+5.975**

Present value of EVAs (MVA) = -3.65 x (1/1.15) + 1.425 x ($1/1.15^2$) + 5.975 x ($1/1.15^3$)

= £1,832

This also equals the NPV. This time a much greater negative EVA is reported at t1 and greater positive EVAs are reported at t2 and t3, demonstrating that EVA could lead to inappropriate performance appraisal, depending on depreciation policies adopted.

So what do the periodic EVAs actually mean? They are simply free cash flows generated in each period after deducting the cost of capital, but unless they are discounted, summed, and referenced to a value as at a single point in time and looked at as a whole, the periodic numbers are meaningless, and form no legitimate basis for rewarding or sanctioning management.

As Fisher argued, it is the stock, and not the flow figure that is important, and the decision to undertake such an investment can only be seen in the light of data about that project throughout its whole life not on a periodic basis. The counter argument to this is that the changes in EVA are of the most importance, not the absolute numbers (Stewart, 1991, p.78). However, by his own argument, if a sinking fund depreciation pattern were to be taken for the above example instead of the sum of the digits pattern, the direction taken by the EVAs in the above example would simply reverse. (See Table 4 below)

Table 4

Point in time	**NOPAT (£'000)**	**EBV (£'000)**	**Depreciation (£'000)**	**Kw (£'000) EBV x 15%**	**EVA* (£'000)**
t0		21			
t1	10	17.5	3.5	3.15	**+3.35**
t2	10	10.5	7	2.625	**+0.375**
t3	10	0	10.5	1.575	**-2.075**

Present value of EVAs (MVA) = $3.35 \times (1/1.15) + 0.375 \times (1/1.15^2) - 2.075 \times (1/1.15^3)$

= £1,832

Therefore in this situation, management would presumably be rewarded upon their performance in the first two periods and sanctioned for poor performance in the last period. Again this pattern of EVAs is determined entirely by the depreciation policy, whilst the original decision to accept the project remains unaltered.

The problem is the relationship between EVA and the EBV, due to the charging of accounting depreciation before arriving at NOPAT. The figures arrived at are highly distorting, and will nearly always under emphasise performance in the early years and over emphasise them in the later years, regardless of the kinds of usual depreciation policies adopted.
The "sinking fund" method is advocated as a method of ameliorating this distortion, but this is an artificial adjustment, and as seen above, may well simply reverse the direction in which EVAs are moving, simply because of an alternative capital re-allocation pattern, without changing the overall conclusion that the initial investment was economically worthwhile.

Economic considerations

If however, EVAs are calculated on the basis of pure economic depreciation, as would be the case in the theoretical economic model, EBVs or the value of the capital at each point in time is strictly based on the present value (PV) of the cash flows yet to be realised from the company or project. If depreciation and asset values are calculated on this basis, the following is arrived at. (See Table 5)

Table 5

Point in time	**NOPAT (£'000)**	**EBV (£'000)**	**Depreciation (£'000)**	**Kw (£'000) EBV x 15%**	**EVA* (£'000)**
t0		22.832 (a)			
t1	10	16.257 (b)	6.575	3.425	**Zero**
t2	10	8.696 (c)	7.561	2.439	**Zero**
t3	10	0	8.696	1.304	**Zero**

Present value of the cash flows =

(a) $10 \times (1/1.15) + 10 \times (1/1.15^2) + 10 \times (1/1.15^3)$ = £22,832

(b) $10 \times (1/1.15) + 10 \times (1/1.1^2)$ = £16,257

(c) $10 \times (1/1.15)$ = £8,696

*In this situation, using pure economic depreciation as with the Hicks model shown in Chapter 4, all resulting EVAs are all zero. The initial £22,823 includes an immediate windfall gain of £1,832 already built into the model at the outset. This also equates with the initial MVA calculated under the EVA model. Only this number has any significance for decision taking at the operational level.

If an initial positive NPV or MVA is made, then the investment should be undertaken, if not it should be rejected. Under this pure model as can be seen from Table 5, NOPAT would always equate to the cost of capital leaving no residual EVA to disclose.

So in essence there is a direct link conceptually with the EVA model and other hybrid valuation models such as economic profit, residual income, earned economic income and their generic root, the Hicksian economic income model. EVA is the minimum amount of cash that the company, under the Hicksian model, would need to re-invest somewhere in order to maintain the market value of the company from a combination of the original investment owned and the alternative investment derived from net cash flows received and re-invested.

The interesting observation to be drawn from all of the above is the notion of the cost of capital as being a hurdle rate, and anything exceeding it as being income or surplus value to shareholders, *whilst under the Hicks model the cost of capital is the income, and the EVA the amount of capital to be re-invested to maintain the original value of that capital.* This raises some fundamental points about value and income, and the perspective taken in these matters. The cost of capital of a company is conventionally perceived as a cost to the company

because this proportion of the wealth created by the business is payable to its investors, to reward them as investing stakeholders. It is possible however to look at the whole issue of shareholder value from the opposite end. Investors will be better off if the cost of capital, as it affects them, is greater. *This is because although it is a cost to the company, it is income to the investor.* In the above example if the opportunity cost of capital invested were 20% rather than 15%, the economic income to the individual would be higher and amounts required for re-investment lower, as the alternative investment would be yielding a higher rate of interest.

The fact that Stewart's (1991) EVA model assumes that there will usually be a growing gap between the economic book values and the market value, known as MVA in a successful company, merely confirms the inability of conventional accounting measurement systems to account and anticipate fully and contemporaneously for market value as assessed by investors in the market. Stewart (1991) also argues that conventional accounting measures of performance and position are irrelevant to the assessment of a company's intrinsic value. He asserts that the stock market continuously discounts changes in expectations about future free cash flows accruing to companies and takes little or no notice of accounting measurements. Measures such as the P/E ratio are merely the result of these perceptions and actions and are not the cause of it. Although many small and unsophisticated investors may use such measures as EPS or P/E ratios to make their investment decisions, these decisions are marginal to the prices set by the market as a whole, which are controlled by a few powerful market makers. By observing market moves as a result of information available, it is possible to argue that traditional accounting measures are irrelevant to those movements. The estimation of free cash flows should be the true basis for valuation, tempered by a floor measure of value such as the realistic liquidating value of the entity's net assets adjusted for unrecognised and separable intangibles. Stewart (1991) argues that market responses to accounting policies such as those related to the amortization of goodwill, and other techniques, confirm the point about the irrelevance of accounting measures. For example, in uniting of interests/merger accounting as compared with acquisition accounting, where the

former did not require the business to subsequently amortize goodwill, although greater earnings would be reported as compared to the latter, in cash terms there would be no difference to valuation whichever method were chosen, therefore no impact on valuation should be recognised from a normative standpoint. Research in this area has confirmed this empirically. Hai Hong, Mandelker, and Kaplan, (1978) undertook research with data going as far back as the 1960s, showing that investors made no significant adjustment to share values of companies on the basis of the accounting method adopted.

Research and development is another area where accounting methods may mislead the investing community as to valuation, where under most generally accepted accounting practice all research expenditure and much development expenditure must be immediately written off to the profit and loss account.

> *"The accountant's cavalier dismissal of R+D is what accounts in part for the sky-high share price multiples enjoyed by the many small rapidly growing high-tech Silicon Valley and Route 128 firms. As in the Mercks case, their stock prices capitalize an expected future payoff from their R+D, whereas their earnings are charged with immediate expense. It is especially ironic to note that, following the acquisitions of R+D intensive companies, the accountants will agree to record as goodwill for the buyer the R+D they had previously expensed for the seller. This R+D can be an asset if it acquired but not if it is home grown"*

(Stewart, 1991, p.29)

The final sentence of this quote relates back to the accounting conventions. An inseparable intangible asset without an open market value may be recognised as goodwill from the historic cost perspective, if purchased, but not if it is organically generated.

Another example used by Stewart (1991) is the accounting treatment of unsuccessful development expenditure such as in the boring of oil wells. He argued that the expenditure upon the unsuccessful wells should be capitalised, as if it were not undertaken it would not be possible to establish the location of productive sites and is allowed in certain circumstances under US GAAP.

Stewart (1991) then concluded by emphasising the relevance of the economic model as opposed to the accounting one:

> *In the economic model, the value of a company is an unfolding journey for its cash, not one-night stands that voyeuristic accountants can take snapshots of. The book value of assets is not an accurate picture of the value of the business, and should not be construed to that purpose*

(Stewart, 1991, p.32)

Although it is difficult to argue with this point, as it is indeed rooted in traditional economic theory, the conclusion of this argument that the company's book value should only be used to measure capital, i.e. the cash put into the company over its life, like a savings account, demonstrates a misunderstanding of the balance sheet and its purpose. The balance sheet may not be, or not even meant to be, a statement of business value, but it is certainly more than the record of cash invested in the business. The capital of a business comprises cash originally and subsequently invested by shareholders, but the equity of a company to some extent reflects values and not just cash equivalents.

For example certain unrealised gains such as revaluation reserves reflect economic value, as the market values of assets are recognised in favour of historic cost valuations. SSAP 21 and IAS 17 require companies to show finance leased assets on the balance sheet. Even the recognition of debtors recognises the valuation of unrealised future economic benefits, as the debt is an intangible asset only to be liquidated when the debtor settles. The accountant under IAS 38 and in the UK SSAP 13 (ASC, 1977) is also allowed to capitalise some forms of

development expenditure in specifically prescribed situations, and also is still (at the time of writing) allowed to capitalise interest payments.

Stewart (1991) recommends that the book values of certain assets should be adjusted for some of the above items in order to arrive at an economic book value of assets. Unfortunately, even after making their numerous adjustments there still remains a goodwill gap, represented by the difference between the economic book value as they calculate it and the market capitalisation, which they describe as market value or MV. The problem is that for the balance sheet to become a true statement of value, an acceptable economic valuation model of a business should be adopted and practised, that could more successfully bridge the gap between accounting numbers and economic realities.

WACC or Cost of equity?

The financial management literature on company valuation has been preoccupied with the derivation of a weighted-average cost of capital in order to find a suitable discount factor for compensating *all long-term investors* for the capital they have invested. From a shareholders' perspective however, WACC is probably an irrelevance. The value of the company to the owners (the shareholders) should exclude the value of debt, as long-term debt is a separate form of finance, as is short term credit, raised on behalf of shareholders to help support the financing of a part of a company's assets. If the company is thought of as belonging to the shareholders it makes sense that the residual income recognised should be based on the cost of equity and not the WACC. Income should be struck net of repayments of loans and preference dividends and discounted by the opportunity cost of investment facing the owners themselves and not upon a hybrid rate partly determined by choices facing third party lenders. From the owners' perspective the net present value of debt is theoretically zero as applying the implicit interest rate to the interest and capital payments would in mathematical terms cancel the debt out exactly. This is because financial instruments are recognised and measured on the basis of their economic cost to the company as is required under FRS 4 in the UK. The

irrelevance of WACC for company valuation can be demonstrated with a simple example (Owen, 1999)

Alternative ways to value an investment

Using the same example as used throughout this chapter, it is assumed that the investment purchased for £21,000 has in this case been financed by £10,000 equity and £11,000 by way of a loan carrying an implicit interest rate of 10%. The loan repayment and interest instalments payable in total are £4,423 at the end of each year.

Again it is assumed that the investment will have a useful economic life of 3 years after which it will be worthless. At the end of each of the three years, the investment will realise cash flows of £10,000.

What are the alternative ways that the investment can be valued? The investors' next best alternative rate of return in an equally risky investment would earn 15% per annum. So the investment can be valued from a pure equity basis as follows:

(10,000- 4,423) x 2.2832* = £12,733 *Present value of an annuity factor (3 years at 15%)

Therefore the net present value of the investment is (12,733 - 10,000) = **£2,733**

At the starting point of the investment, the NPV of the investment, the MVA and accounting goodwill (market value – invested book value) now all coincide i.e. at a figure of £2,733

As long as the difference between the cash income and the interest payable to the lenders has an NPV exceeding the originally invested equity, it will be worthwhile for the owner to borrow the £11,000 at 10% and invest the £10,000 in the investment themselves. If not, it would be better for the owner to invest the £10,000 directly in the next best alternative investment.

If the value of the investment to all long-term investors is now calculated using WACC as the discount factor, it is possible to observe whether the value of the investment will be different, than when valuing it using the equity method:

WACC = (10,000 x 0.15) + (11,000 x 0.10) / 21,000 = (1,500 +1,100) / 21,000 = 0.1238 = 12.38%

The cash flows available to all investors = £5,577 + £4,423 or £10,000 per annum.

The PV of this annuity is:

10,000 x 2.3733* = £23,733 *Present value of an annuity factor (3 years at 12.38%)

23,733 - (11,000 +10,000) = **£2,733** *which is exactly the same as the valuation arrived at previously using the equity method.*

Following on from this argument, it is possible to say that debt from the perspective of the owner has a *zero net present value*, and the choice of whether to use WACC or the cost of equity as the discount factor is immaterial – because the same valuation is arrived at under both approaches, but as can be seen from the above example, it is simpler and much more relevant and direct to use the pure equity method.

Where does the above chain of argument leave us in the quest for a hypothesis and a methodology? Accounting reports are usually prepared from the proprietor's perspective, and the balance sheet focuses on the net assets of a business as financed by the total equity of the business not upon all long-term finance.

The market capitalisation of a company is based on the aggregate market value of the ordinary shares within the company and does not include by definition the value of assets

financed by other long-term investors. It is important to keep this in mind when constructing a valuation model because the valuation model determines the discount rate to be used. To find the value of the company to its shareholders requires an assessment of the future expected cash flows *to shareholders* from the investment discounted by the *shareholder's cost of equity,* whereas the value of the company to all its long-term investors is determined by the expected future cash flows *accruing to all investors*, discounted by a *weighted-average cost of capital.* Much of the traditional literature uses the weighted-average cost of capital, on the grounds that this is the opportunity cost rate facing all long-term investors in the business. Is it appropriate to use this rate or would it be more appropriate to use the opportunity cost of equity as the discount factor, on the basis that the value of the company to them is what is relevant to shareholders, net of what these owners have borrowed in terms of long term debt and preference shares? The truth is that it doesn't matter because the intrinsic value of the company to its shareholders would be the same whether the cost of equity or the weighted average cost of capital was used as demonstrated in the example worked through above.

Using the shareholder valuation model, the relevant opportunity cost would be the rate of return equity investors could obtain in an equally risky next best alternative investment, multiplied by the proceeds to be obtained from selling their shares. Under this hypothesis, the intrinsic value of their shares should in theory be broken down as follows:

The present value of future cash inflows generated from the total assets held by the company at the time of valuation, net of all cash expenses, cash working capital and long-term/fixed asset expenditure, cash interest and preference dividends paid, and net of any cash redemptions of debt and/or preference share capital and other liabilities.

Conclusions

To conclude this chapter therefore, the economic model of valuation determines that the flow of cash income is the primary basis for the valuation of a stock of capital held by an investing

individual or the business enterprise. The difference between the originally invested capital and the present value of the future cash flows discounted at an appropriate rate equals the net present value of the investment or *inherent goodwill* in accounting terminology. To reconcile the pure economic model with the concept of 'clean surplus' (being the basis of hybrid economic and accounting models such as economic profit, residual income, and earned economic income) it is clear that under all these approaches, total cash flows anticipated over the expected economic life of the investment comprise the cost of the original cash investment at t0, the total opportunity cost of investing this cash in the current investment over the economic life of the investment and a residual which is equivalent to the positive net present value of the investment.

This reconciliation can be summarised using the same example as used throughout the chapter as illustrated in Table 6 below:

Table 6: Breakdown of company value from Figure 2:

Economic model		EP/RI/EEI:		EVA model:	
	(£)		(£)		(£)
Cash invested	21,000	Opening capital/assets	21,000	EBV	21,000
Economic income	7,168	Opportunity cost	7,168	Cost of capital	7,168
Windfall (SGW)*	1,832	Clean surplus	1,832	MVA	1,832
Total cash	30,000		30,000		30,000

*SGW = Subjective goodwill (Edwards and Bell, 1961)

Note that under each variant of the economic approach discussed in this chapter, the total expected cash inflows are broken down into three constituent elements: the original cash invested which is converted into capital in economic terms or assets in accounting terms; into economic income, opportunity cost or cost of capital; and finally into a windfall gain, a clean

surplus or EVA/MVA. The intrinsic value of the company from all three perspectives is the invested capital plus the clean surplus (however this is described). However, under the traditional accounting model there is no recognition of a clean surplus or (unrealised profit) because future earnings and the associated opportunity cost element is effectively ignored so the company at the time of the investment is simply recorded as an investment of £21,000 as broken down into various tangible monetary and non-monetary assets however composed. The fact that the theoretical market value of the company would in theory be £22,832 (the maximum price an acquiring company would be prepared to pay for the company) is not recognised as this would be tantamount to capitalising inherent or 'home grown' goodwill, prohibited under generally accepted accountancy practice.

Therefore, from each of the perspectives discussed in this chapter and in Chapter 4, including the post-acquisition traditional accounting model, the intrinsic value of the company from the shareholders' perspective should in theory all coincide.

In the following chapter a comparison of these valuation paradigms and the detailed decomposition of accounting goodwill as between internally generated goodwill and purchased goodwill and how it changes on acquisition and over time will be further explored, where the market value of a quoted company will be decomposed and reconciled using the example of a group of companies immediately post-acquisition.

CHAPTER 6: A COMPARATIVE MODEL FOR THE DE-COMPOSITION OF THE MARKET CAPITALISATION OF A QUOTED COMPANY

In Chapters 2, and 3, the definition of goodwill and the difference between purchased and inherent goodwill were explored. In Chapters 4 and 5, the concepts of economic income, a 'clean surplus' based accounting income and a hybrid model where MVA represented the difference between the market value and economic book value of a business were introduced. This discounted 'clean surplus' value or MVA premium represented anticipated future profits, recognised under the economic model, but excluded from the accounting model.

In this chapter an attempt is made to reconcile within a comparative model, the alternative ways of decomposing value, including the recognition of differences between the two distinct types of goodwill and how they could relate to the economic valuation paradigm or a hybrid model. This model is adapted from the original work of the author (Owen, 2000).

Despite the problems accountants have in associating specific income flows to individual assets or to their originating expenditure and the resultant gap between economic and accounting values, it may still be possible to construct a model for decomposing the main constituent elements of company value. This model may be helpful in reconciling the accounting and economic perspectives. Goodwill is one of the main elements of value in companies which have grown by acquisition as in accounting terms it is only recognised when a business is acquired.

Under this model it is assumed that when one company takes another over, the post-acquisition market capitalisation of the group or its economic present value can be broken down in several ways. These are depicted in Figure 1:

Figure 1: Market capitalisation of a group at acquisition

<table>
<tr><th>Breakdown (a)</th><th>Breakdown (b)</th><th>Breakdown (c)</th><th>Breakdown (d)</th></tr>
<tr><td>Group market cap. premium</td><td>External synergies</td><td>Inherent g/w on acquisition</td><td rowspan="2">Market Value Added (MVA)</td></tr>
<tr><td rowspan="6">Pre-acqn market capitalisation of holding company</td><td>Macro econ factors</td><td rowspan="3">Accumulated inherent goodwill</td></tr>
<tr><td>Internal synergies</td></tr>
<tr><td rowspan="2">Hidden assets</td><td rowspan="4">Economic Book Values (EBV)</td></tr>
<tr><td>Purch g/w on acquisition</td></tr>
<tr><td>Cum purch g/w</td><td rowspan="3">Accounting book values</td></tr>
<tr><td>Fair value of separable intangibles</td></tr>
<tr><td>Fair value of separable tangibles</td></tr>
</table>

Assuming there exists an efficient capital market for shares, in theoretical terms, the market capitalization of the group, immediately after an acquisition takes place should equate to the economic present value of the group based on the expectations of the market about the cash generating potential of the new group into the future under its new management, ownership and financial structure.

Column (a) therefore breaks down the present or market value of the group into two components. First, the market capitalisation of the holding company immediately prior to acquisition, and second, the amount by which the market capitalisation of the new group exceeds it, after taking into account capital repayments made to the shareholders of the acquired subsidiary. Defined in other terms, this market capitalisation premium is equivalent to the initial windfall gain or subjective goodwill in the economic model, to the positive NPV arising in capital investment appraisal or to part of the MVA in the EVA model.

It is also possible that the total market value of a group of companies immediately following an acquisition could also be broken down in to several constituent drivers as identified in column (b) in Figure 1 above.

From the bottom up, the first constituent is the value of separable tangible assets:

These would include all tangible assets valued at their current fair values. Next are the fair values of separable intangibles: These include intangible assets falling within the currently accepted definition of assets, both in company law and by the ASB, such as patents, trademarks, development expenditure etc.

After recognising tangible and intangible separate assets, there is another constituent of value known as hidden assets: These are the intangible assets which are not identified within the accounting system and are the source of future economic benefits, but which do not fall within the currently accepted definition of assets. These may include expenditure on advertising and promotion, research and development, operating leases, and on employee training, on 'golden hellos' and 'goodbyes' etc. The EVA model would capitalise some of these, such as research and development expenditure, and operating lease payments, but as with the traditional accounting model disregards the others.

Beyond all the separate assets recognised and hidden are that part of market capitalisation represented by Chambers (1966) and Lee's (1971) internal synergies as explained in Chapter 3: These would be the additional values placed on separable tangible and intangible assets, hidden or visible, through working in concert within the entity.

At any point in time, a proportion of the market capitalisation of any company may be due to systematic macro factors affecting the demand for equities generally and sectorally. These factors would include interest rates, exchange rates, taxation policies, and general economic and political influences. It is assumed that these factors have a general effect on a company's market capitalisation, which may not in any way be specific to the performance of the company or group itself.

Finally at the top of the column are the external synergies: These are anticipated from integrating the activities and assets of the subsidiary into the new group. These can be

obtained by a number of ways, but most of them revolve around strategic factors, such as possible rationalisation opportunities, or through opportunities to share distribution channels, customer bases, and supply chains. In its simplest terms they would represent a figure based on the market capitalisation value of the new group *less* the market capitalisation of the holding company immediately preceding the acquisition date, just as in column (a).

If the market capitalisation of the new group is greater than the market capitalisation of the holding company, immediately preceding the acquisition, net of capital payments made to subsidiary shareholders, it may be assumed that some degree of external synergy has been recognised and discounted by the stock market. In this situation, all purchasing shareholders are theoretically better off as a result of the acquisition.

Column (c) then breaks down the market capitalisation of the group into five elements. First, accounting book values, which should be equal to the fair values of all recognised tangible and intangible net assets. Second is the accumulated purchased goodwill within the group accrued from previous acquisitions not yet expired. Third is the purchased goodwill acquired in the current acquisition, which represents the difference between the price paid for the subsidiary and the fair values of its net assets acquired. Fourth is inherent goodwill grown organically to replace older purchased goodwill. Fifth is the inherent goodwill arising through the current acquisition being equivalent to the market capitalisation premium on acquisition in column (a) or external synergies in column (b).

As the group grows organically, all purchased goodwill is likely to depreciate as the benefits of previous investments are eventually realised, but inherent goodwill may well increase to replace it as new "investing" expenditure is incurred and other drivers influence the total amount of inherent goodwill within the group. However, the only objective way to test if goodwill as a whole is increasing or declining is to periodically compare the group market

capitalisation with the historic figure to see if goodwill as a whole has increased or has been impaired as is now required under IFRS 3 under international GAAP.

Finally column (d) simply breaks down market capitalisation within the framework of the EVA model. One part of the market capitalisation is the economic book value (EBV), which would exceed accounting fair values, due to the recommended adjustments to the accounting accruals system including all adjustments for purchased goodwill. It would not account for all hidden assets due to the EVA model's failure to make adjustments for certain types of "investing" expenditure, when calculating NOPAT, such as human asset expenditure for example. The residual element of market capitalisation within the EVA model is the MVA, which is simply the difference between the EBV as calculated, and the market value as observed. Increases in MVA would be the result of successful acquisitions where external synergies were gained, or where organically the group was investing successfully in developing its "hidden" assets, improving its internal synergies, or benefiting from favourable macro economic factors. Total MVA in column (d) is therefore likely to include most of the inherent goodwill in column (c).

Figure 1 overall therefore encapsulates the integral relationship between the economic, the accounting and the "hybrid" EVA model of valuation.

Referring back briefly to the economic model, the shareholders were assumed to be better off if any investment realised an initial positive NPV, MVA, or "windfall gain". During the period of the investment, shareholder value is created if positive windfall gains are unexpectedly made in subsequent periods, indicating that initial expectations were being exceeded. Value on the other hand would be destroyed if future expectations were not met as anticipated. It is therefore sensible, in a global sense, that management should be rewarded or sanctioned on overall changes in market capitalisation, net of capital introductions and withdrawals, over time.

It would also seem appropriate therefore, to appraise management on the periodic growth in the market value of the company based on an-ex post assessment of the continuing market value of the capital invested in the business.

The immediate success of acquisitions can be assessed by comparing the market capitalisation of the original holding company immediately prior to acquisition with the market capitalisation of the group on acquisition. If the latter exceeds the former, the holding company's shareholders are clearly better off. The assumption that synergy is normally obtained from an acquisition has been empirically tested by some researchers and it has been found that in most cases no such synergy arises and shareholder value is often destroyed through over paying for investments. (Sirower, 1997; Agrawal *et al*, 1992 and Limmack, 1991)

In financial reporting terms the company could in theory report the difference between the fair values of its recognised tangibles and intangibles (including purchased goodwill) and its market capitalisation as inherent goodwill and as a market capitalisation reserve (MCR). However, the recognition of inherent goodwill is explicitly prohibited under generally accepted accounting practice.

From a performance evaluation perspective, management should in theory be rewarded for increasing inherent goodwill, either through acquisition, or through organic growth. Where market capitalisation falls net of capital introductions and withdrawals, either following an acquisition, or by the end of a financial period, management should be held responsible. Clearly however, management could not be held responsible for any part of the change in market capitalisation due to macro and market based factors not within their control as stewards of the company.

The above model for financial reporting may be further explored by the use of an illustrative example. Company A, which has never previously acquired another entity, takes over 100% of Company B, which has built up inherent and purchased goodwill since its incorporation.

Company A:

Net assets:	**£'m**	**Ownership interest:**	**£'m**
Tangibles	30	Share capital (£1 shares)	25
Intangibles	10	Revenue reserves	15
Goodwill*	5	Market capitalisation reserve*	5
Market value:	45		45

* All inherent goodwill built up in A since incorporation

Company B:

Net assets:	**£'m**	**Ownership interest:**	**£'m**
Tangibles	10	Share capital (£1 shares)	10
Intangibles	5	Revenue reserves	10
Goodwill*	10	Market capitalisation reserve**	5
Market value:	25		25

* Goodwill comprises £5m inherent goodwill and £5m purchased goodwill

** The market capitalisation reserve represents only the inherent goodwill as the purchased goodwill has been cancelled against the cost of control account.

Company A purchases 100% of B's net assets including the purchased goodwill for a consideration of £35m cash. Immediately following the acquisition, the market capitalisation of the group AB rises to £55m.

Group AB:

Net assets:	**£'m**	**Ownership interest:**	**£'m**
Tangibles (30+10-35)	5	Share capital (£1 shares)	25
Intangibles (10+5)	15	Revenue reserves	15
Goodwill*	35	Market capitalisation reserve**	15
Market value:	55		55

** Increase in market capitalisation reserve (15-5) = 10 (inherent goodwill from external synergies through combination.)

*** The goodwill of the new group is comprised of the following:**

	£'m
Inherent goodwill from Company A	5
Purchased goodwill on acquisition of B (35-20)	15 Note 1
Purchased goodwill already recognised in B's books	5 Note 1
Inherent goodwill from external synergies (55-45)	10
	35

Note 1: The total purchased goodwill (£20m) is broken down into two components. First is the difference between the consideration and the fair value of the equity acquired (35-20) £15m and second, the £5m purchased goodwill previously recognised within the net assets of B subsequently acquired by A.

The total market capitalisation of the new group may be broken down as follows in Figure 2:

Figure 2: Breakdown of market capitalisation of Group AB:

(a) (b) (c) (d)

<table>
<tr><td rowspan="5">Market capitalisation premium (£10m)</td><td rowspan="4">External synergies on combination (£10m)</td><td>IGW arising from acquisition (£10m)</td><td rowspan="2">Market value added of AB Group (£15m)</td></tr>
<tr><td rowspan="3">Market capitalisation of company A at date of acquisition

(£45m)</td><td>IGW A (£5m)</td></tr>
<tr><td rowspan="2">Macro factors £m?
Internal synergies £m?
Hidden assets £m

Total (£25m)</td><td>PGW in A (£15m)</td><td rowspan="3">Economic book value of AB Ltd

(£40m)</td></tr>
<tr><td>PGW from B (£5m)</td></tr>
<tr><td>Fair value of intangible assets (£15m)</td><td>Accounting fair values (£20m)</td></tr>
<tr><td>Tangible assets (£5m)</td></tr>
</table>

As can be seen from Figure 2, the £55m market capitalisation of the group (post-acquisition) is decomposed in several different ways. First, the group's market capitalisation can be divided into the pre-acquisition market capitalisation of company A on its own (£45m), and the market capitalisation premium of the acquisition, net of the payment to B's shareholders (£10m).

Second the market capitalisation may be broken down into external synergies arising on combination which is equal to the market capitalisation premium (£10m), the fair values of the tangible and intangible assets of the group AB (£20m), leaving £25m comprising unrecognised hidden assets, internal synergies, and macro factors. How these break down into individual components is probably very difficult to measure.

Third, the market capitalisation may be broken down into fair values of accounting net assets (£20m), with total goodwill being broken down between purchased and inherent goodwill (£35m).

The elements of goodwill would include goodwill from external synergies arising from the combination of A and B (£10m), the £5m goodwill already inherent in A's books, and the £20m goodwill purchased from B which includes £5m previously purchased by B. Note that all goodwill bought from the subsidiary whether it was inherent or previously purchased, *would now be included in the accounts of the new group as purchased goodwill.*

Finally, in the right hand column, market capitalisation can be broken down into economic book value (EBV), and market value added (MVA). EBV comprises the fair values of all separable net assets, plus all purchased goodwill at the time of acquisition, including some hidden assets not normally capitalised under GAAP, such as research and development. MVA comprises all the inherent goodwill already included from the holding company and those arising from external synergies arising on acquisition. The extent to which the EBV in an ongoing situation would include some element of the inherent goodwill of a company depends on the actual amortisation and impairment policies adopted for the purchased goodwill and upon the recommended adjustments made to accruals based accounting.

In order to observe the effect of generating inherent goodwill within the group after one period of organic growth, the balance sheet of Group AB can be compiled. During the period the company made an accounting profit or EVA of £3m, £1m was distributed to shareholders as dividends, and the market capitalisation of AB had risen to £64m at the year-end.

Group AB (after one period's trading):

Net assets:	**£'m**	**Ownership interest:**	**£'m**
Tangibles (5+3-1)	7	Share capital (£1 shares)	25
Intangibles	15	Revenue reserves (15+2)	17
Goodwill*	42	Market capitalisation reserve**	22
	64		64

* **Goodwill is now comprised as follows:**

	£m
Unexpired total purchased goodwill from previous acquisitions	20
Unexpired inherent goodwill from external synergies (AB combination)	10
Unexpired inherent goodwill in A prior to combination	5
Inherent goodwill from organic growth in the current period	7
	42

** The market capitalisation reserve has increased by (22-15) £7m, which is entirely due to an increase in inherent goodwill and is calculated as follows:

New market capitalisation - (old market capitalisation + increase in separable net assets)

= 64 - (55+2) = £7m.

Note however that it is not possible to assume that the growth in inherent goodwill was only £7m. It is inevitable that some of the purchased goodwill would have expired during the period due to realising some of the benefits associated with it. If that were the case, additional inherent goodwill must have been generated to replace it and to achieve the net increase in goodwill within the group. What is more important than knowing the separate value of each component of the total goodwill, is that this total amount will have been benchmarked against the stock market assessment of its value and that the total amount is being tested for economic impairment as now required under current generally accepted accounting practice.

However, had the market capitalisation of AB group declined (net of any change in separable net assets), it may be assumed that an impairment of goodwill would have taken place.

Opportunities for future research

Several lines of research enquiry exist for decomposing the total goodwill within a company or group. First it may be possible to establish through multiple regression, or other techniques, how significant the components of investing expenditure that create and develop hidden assets might be in driving inherent goodwill. It may also be possible to ascertain empirically to what extent goodwill within a specific company may be systematic or unsystematic. This would require the observation of share prices movements in general, against those of individual companies, and to observe the extent to which movements in goodwill are due to company specific factors or to wider sectoral or market forces, linking back to CAPM and the use of alpha and beta factors in respect of risk.

Having established the relative significance of each of the above constituents, it may be that the remaining residual could be attributed to non-measurable internal synergistic factors. These factors are accounted for holistically within the economic model, but not within the accounting model.

As a separate investigation there may also be future research opportunities with respect to empirically measuring the external synergies to be obtained from acquisition as a growth strategy. It may be possible to measure to what extent the market capitalisation of a company rises on anticipation of a take-over. What premiums are made on those acquisitions above the market capitalisation value of the holding company at the time of the transaction, and what are the subsequent post-acquisition effects on goodwill? In the above example it was suggested that the market capitalisation of a group might (or at least should) be higher after the acquisition on the grounds that certain synergies would be obtained. Is this always the case? Studies have been undertaken showing that in many cases there is a 'synergy trap' (Sirower, 1996), where bidding companies often pay too much for the acquired company, destroying value within the new group but creating value within the acquired company up to the point of acquisition.

Conclusions

This chapter reconciled the decomposition of the value of a group immediately post-acquisition from several different perspectives. The reconciliation involved a detailed explanation of how goodwill can be decomposed into purchased and inherent goodwill from the acquired and the acquiring company and how these may be recognised and measured post-acquisition. The model also identified sources of surplus value on acquisition such as internal and external synergies and also reconciled the total accounting value of a business with the valuation as derived from an EVA perspective.

In the next chapter a pure cash flow model for valuing a company is examined, as a basis for deriving an empirical model to test any significant statistical relationships between expected cash flows and the total market capitalisation of a company (including accounting goodwill).

This model in effect introduces a fifth alternative way to calculate or account for the market capitalisation of a company or group of companies.

CHAPTER 7: CASH BASED VALUATION MODELS AND SHAREHOLDER VALUE ADDED

Introduction:

In Chapter 6 the value of a company was decomposed in several ways. This comparative model demonstrated that the total value of a group of companies can be made up of several constituents. These constituents vary according to the perspective taken. Under the traditional accounting paradigm the total value of the company is made up of the fair value of separable tangible and intangible assets and the residual comprises various tranches of purchased and inherent goodwill. As explained in Chapter 4, goodwill is the embodiment of any timing differences between the cash based, forward looking approach of the economic model and the traditional accounting approach based on such concepts as realisation, accruals, and historic cost. The hybrid models such as residual income and EVA also sub-divide total market capitalisation into book values and residual values but these models tend use a clean surplus notion where the recognised 'economic profit' anticipated into the future is discounted at a cost of capital leaving profit after the cost of supplying long-term capital to the business has been met. These models still use the accounting concept of 'matching' or 'accruals' in determining the profit figure and so will still exhibit some of the timing differences of traditional accounting based methods, leaving an inevitable goodwill residual, known as MVA in the Stewart (1991) model.

In this chapter the economic concepts introduced in Chapter 4 will be revisited and applied to an accounting situation where cash based measures are used to determine value so as to avoid the problem of artificially separating accounting book values and goodwill or the MVA residual. This chapter discusses the cash based valuation model and will introduce the concept of measuring free cash flows as the basis of measuring income and determining value. The key

model discussed towards the end of this chapter is the Shareholder Value Added (SVA) approach, first propounded by Alfred Rappaport. (Rappaport, 1986).

Cash flow measures of income and value:

Traditional accounting measures of profit can be very different to cash flow measures. This is shown below by way of an example:

A company sets up at the beginning of the year with £100,000 capital. It purchases £20,000 of fixed or long-term assets, £20,000 of stock and sells the stock for £55,000, incurring £10,000 expenses. At the end of the period it owes £10,000 to suppliers of stock, and is owed £15,000 from debtors. It also owes £4,000 to other suppliers. Stock on hand at the year-end is £12,000 and the fixed or long-term assets are deemed to have depreciated by 20%

Traditional accounting and cash flow accounting would determine 'profit' as follows:

	Historic cost based calculation:		**Cash based calculation:**
	£	**£**	**£**
Revenue		55,000	40,000
Purchases	20,000		10,000
Less closing stock	12,000		
Cost of sales		8,000	
Gross profit		47,000	30,000
Expenses	10,000		6,000
Depreciation	4,000		
		14,000	
Net income (cash flow)		33,000	24,000

Note that there is a significant difference between the two bottom-line figures. The cash based "surplus" on the right ignores the accruals concept by excluding amounts owing or owed by

debtors and creditors, all stock adjustments and ignores depreciation, as this is non-cash expenditure. When the economic concepts of the "time value of money" and opportunity cost are taken into account, it is clear that it is cash flows and not reported accounting profits that are critical to valuation because the whole premise of discounting is cash based. Only cash surpluses can be re-invested and not profits. Accounting profits, because of adherence to the accruals concept, are therefore not appropriate for company valuation under the fundamental economic concepts as developed by Fisher (1930), Lindahl (1938), and Hicks (1946) and introduced in Chapter 4.

Discounted cash flow:

When evaluating projects within a business and deciding upon the most efficient way to allocate and deploy resources, traditional discounted cash flow models have been used for many years. These models concentrate on giving an economics based decision rule that investment should go ahead if it adds value to the business after the cost of capital has been met. Applying a discount factor based on weighted average cost of capital (WACC) or cost of equity (Ke) to expected net cash flow earnings or savings from a project and comparing this with the initial monetary amount of the investment provides the best guide to maximising the wealth of investors. As explained in Chapter 5, it is not necessary and also simpler (when taking the shareholders' perspective) to discount cash flows net of borrowing costs and the benefits associated with the project and use the cost of equity based on the capital asset pricing model to value the project.

A business creates value for its shareholders if it continually invests in projects providing a positive net present value (NPV). The NPV is strictly based on *cash flow projections* and not estimations of accounting profit. The most difficult aspect of arriving at the theoretically correct present value of the cash flows associated with any individual project is the determination of an appropriate cost of equity. This is arrived at by assessing the required rates of returns of

shareholders and largely determined by the risks faced in the project or the company (unsystematic risk), or through investing in the sector or in shares as a whole (systematic risk). The arguments around the determination of the cost of equity and the financial management and economic theory underlying this, lies outside the scope of this thesis.

Using cash flow forecasts to value companies

As with evaluating alternative projects, estimating the value of a whole company is best achieved, according to economic theory, by estimating future cash flows generated by the business into perpetuity. For this to be done correctly the following need to be estimated:

- Timing and amounts of cash receipts from customers and debtors
- Timing and amounts of cash payments for stocks and expenses and to creditors
- Timing and amounts of cash receipts and payments from borrowers and to lenders
- Timings and amounts of taxation paid
- Timings and amounts of cash outlays on internal fixed assets
- Timing and cash outlays on shares in other companies through acquisition and merger

In theory the net or free cash flow remaining at the end of each period into perpetuity and discounted by the cost of equity should yield the present value of the company to its shareholders.

In an efficient capital market, the discounted present value of a company's expected free cash flows into perpetuity should in theory equate to its market capitalization. Any differences between them in practice would depend upon how efficient the market was and particularly how efficient information about companies was disseminated to investors. However, under this model of valuation there would be no concept of surplus value in theory, as the value of individual assets

would be based on each of their individual and collective contributions to the generation of overall company free cash flows during their expected economic lives. Clearly the measurement of the value of individual assets causes the most problems for accountants, as it is probably impossible to accurately disentangle the individual contribution that each asset or group of assets makes in net present value terms to the total free cash flows generated by a company as a whole during any particular financial period.

Shareholder value added (SVA)

Alfred Rappaport in 1986 introduced the concept of shareholder value added (SVA) to the area of company valuation. The shareholder value approach estimates the economic value of an investment by discounting forecasted future cash flows by the cost of capital. The cash flows are estimated for a suitable forecast period (five years) giving a theoretical or intrinsic value for the company at the end of each financial period. This is equivalent to the market value of the company and as explained above should in theory relate to the market capitalization of the company. Any increase in the total value of the company between one period and another is known as Shareholder Value Added (SVA) and any reduction in the total value of the company between one period and another would be known as shareholder value destroyed (SVD).

Rappaport suggested that value creation was as a result of seven key cash value drivers:

1. Sales growth rate
2. Operating profit margin
3. Income tax rate
4. Working capital investment
5. Fixed capital investment
6. Cost of capital

7. Forecast duration

Rappaport (1986) argued that given a base sales figure if the other factors were known or could be estimated, the free cash flow available to the shareholders of the company could be determined in any given period.

The SVA model – an illustrative example:

REGENCY PLC:

The following example is an original example based on MBA lecture notes from Emile Woolf College (Owen, 2002). The example illustrates how the Rappaport model can be used in practice to value a company. The illustrative example adapts the Rappaport model to be consistent with the notion that cost of capital is more appropriately based on return on equity (as argued in Chapter 5) and therefore requires cash flows to be calculated net of borrowing costs and receipts.

Below in summary form are the main income statements from Regency PLC for the last three years:

Regency is a company providing private education in central London and which has been growing steadily for several years since its incorporation in 1995. Its estimated cost of equity is 10%

Income and expenditure account (Regency Plc):

	1998	1999	2000
	£'000	£'000	£'000
Sales	80	120	150
COS*	50	70	75
Gross profit	30	50	75
Operating expenses*	15	25	35
Interest	5	5	10
Net profit before tax	10	20	30
Taxation at 30%	3	6	9
Net profit after tax	7	14	21
Dividends	3	6	9
Retained profits:	4	8	12

* The cost of sales and operating expenses include depreciation. Depreciation charges were £6,000 in 1998, £8,000 in 1999, and £15,000 in 2000.

Balance sheets for Regency PLC as at 31st December 1998,1999, and 2000:

	1998	1999	2000
	£'000	£'000	£'000
L-T Assets at cost	200	250*	320*
Depreciation	50	55	70
Net book value	150	195	250
Current assets:			
Stock	2	4	6
Debtors	40	52	68
Cash	20	25	40
Total assets:	212	276	364

* Fixed assets costing £10,000 were disposed of in 1999 for a profit of £5,000. There were no fixed asset disposals in 2000.

Capital and liabilities:	£'000	£'000	£'000
Current liabilities:			
Creditors	10	16	18
L-T Loans (10%)	50	50	100

Capital and reserves:

20p ordinary shares	150	180	200
Share premium	nil	20	24
Retained profits	2	10	22
	212	276	364

Regency PLC has 1,000,000 paid-up and issued shares valued at £0.30 each on the London Stock exchange.

Next cash flow statements for 1999 and 2000 are prepared:

Reconciliation of net profit BIT to operating cash flow:

	1999	**2000**
	£'000	**£'000**
Net profit BIT	25	40
Add back depn.	8	15
	33	55
Less profit on disposal	(5)	nil
	28	55
Increase in stocks	(2)	(2)
Increase in debtors	(12)	(16)
Increase in creditors	6	2
Operating cash flow:	20	39

Cash flow statements:	1999	2000
	£'000	£'000
Cash flow from operations	20	39
Less interest paid	(5)	(10)
	15	29
Less taxation:	(6)	(9)
	9	20
Less equity dividends	(6)	(9)
	3	11
Expenditure on fixed assets	(60)	70
Proceeds from disposal	12	
Cash flow after investing:	(45)	(59)
Loans raised	nil	50
Shares issued	50	24
Net cash flow for year:	5	15
Add opening cash	20	25
Closing cash:	25	40

The above cash flows form the basis for the future cash projections and for estimates of the operating margin, the tax rate, and capital expenditure value drivers.

The cash operating margin as a % of sales =

	1999	**2000**
	£'000	**£'000**
Cash flow from ops	20	39
Sales	120	150
%	16.66	26

Mean cash operating margin = (16.7+26)/2 = 21.33%

	1999	**2000**
	£'000	**£'000**
Taxation cash flow	6	9
Operating cash flow	20	39
%	30	23.08

Mean cash tax rate = (30+23.08)/2 = 26.54%

	1999	**2000**
	£'000	**£'000**
Depreciation	8	15
Operating cash flow	20	39
%	40	38.46

Mean cap exp rate = (40+38.46)/2 = 39.23%

To establish past sales growth as a basis for future projections, we can re-state the growth model as follows:

$g = \sqrt[n]{(\text{Sales 2000}/\text{Sales 1998})} - 1$

Where g = annual growth rate between two points in time

And n = number of financial periods

So $g = \sqrt[3]{(150/80)} - 1$

Therefore sales growth from 1998 to 2001 has historically been **23.31%**

CASH FLOW PROJECTIONS (Regency PLC):

	2001	**2002**	**2003**	**2004**	**2005**
	£'000	**£'000**	**£'000**	**£'000**	**£'000**
Projected sales	185	228	281	347	428
Op. margin	39.46	48.63	59.94	74.02	91.29
Tax cash flow	10.47	12.91	15.91	19.64	24.23
Cash profit after tax	28.99	35.72	44.03	54.38	67.06
Capital expenditure	11.37	14.01	17.27	21.33	26.31
FCF:	17.62	21.71	26.76	33.05	40.75

The Rappaport model arrives at the present or intrinsic value of the company to its shareholders as follows:

$$SV = \Sigma FCF/(1+ke)^t) + ((FCF/ke)/(1+Ke)^n)$$

Where FCF = annual cash flow

Ke = cost of equity

t = time period

n = number of periods

The last expression on the right hand side is the terminal value of the company at the end of the fifth period being the FCF in the fifth period divided by the cost of equity. This assumes that no further growth will be achieved beyond the forecast period, as might be expected from normal economic competitive dynamics.

Below is a calculation of the intrinsic value of Regency PLC:

Year:	FCF:	PV:	CUM PV:	PV of RV:	CUM SV:	SVA:
	£'000	£'000	£'000	£'000	£'000	£'000
2001	17.62	16.01	16.01	160.10	176.11	
2002	21.71	17.95	33.96	179.46	213.41	37.30
2003	26.76	20.12	54.07	201.16	255.23	41.81
2004	33.05	22.55	76.62	225.48	302.10	46.87
2005	40.75	25.27	101.89	252.74	*354.63*	52.54

The cumulative shareholder value in 2005 in the table is the same as the present value of the company in 2000 £ terms.

As the market capitalization of the company is (1,000,000 x 30p) the company is under valued by (300,000 – 354,630) £54,630, and ***in theory its shares should be purchased.***

The final SVA column shows that shareholder value is gradually being added every year, with £52,540 being added between 2004 and 2005.

Limitations of the model:

The above model is very useful in arriving at a theoretical measure of shareholder value and how it changes over several financial periods, but some of the assumptions within the model are very simplistic. Below are a few limitations of the model as a valuation tool:

- Assumption that sales growth rate will continue at the same rate as it has historically.
- Assumption that the cash operating margin will be constant for the forecast period and that this will be the same as the historic mean.
- Assumption that fixed capital expenditure will continue to be a constant % of cash profit after tax before depreciation, and that the past mean depreciation charge can be used as a surrogate for actual cash expenditure on fixed assets.
- Assumption that cash tax rate will be constant for the next five years and beyond
- Assumption that the required cost of capital will be constant into perpetuity

In reality, some of these drivers will change over time and management's main objective must be to maximize value through improving the future impact of these drivers and to maximise shareholder value.

Differences between the Rappaport and adapted approach:

Rappaport requires SVA to be calculated using WACC as the discount factor and calculating free cash flows gross of interest payments. Under his method he discounts the free cash flows using WACC and then adds on the value of marketable securities and investments, and finally subtracts the market value of debt to arrive at shareholder value.

As explained in Chapter 5, using the concept of adjusted present value, it is equally valid and probably simpler to calculate cash flows net of interest payments and receipts and to discount by the cost of equity. Under this adapted method there is no need for these final two adjustments, as cash flows available to shareholders builds in the present value of marketable securities and investments with interests and dividends receivable from these expected in the future forming part of the forecast cash flows, and with the present value of debt in theory being zero as far as shareholders are concerned.

Conclusions

This chapter has examined the cash based valuation paradigm and has concluded that in theory the intrinsic value of a company must be based on expectations of the free cash flows to be generated by a company for its shareholders into perpetuity. The key point is that according to economic theory it is cash that drives value, as it is only cash that can be invested and re-invested and not accounting profits. For this reason the value of a company to its shareholders must be based on the company's ability to generate cash for the payment of dividends and for re-investing in further cash generating projects both within and outside the company or group.

The Rappaport model was discussed as a useful and appropriate vehicle for estimating the intrinsic value of a company whilst recognizing its shortcomings. This model was explained and illustrated using a practical example adapting the model to a pure equity based perspective and using a limited time horizon of five years.

The conclusion to be drawn from this analysis is that the market capitalization of a company can also be reconciled as being equivalent to discounted free cash flows expected into perpetuity. Under this model, as with the economic model and unlike the hybrid accounting/applied financial management models, such as economic profit, residual income, earned economic income and EVA™, there is no artificial separation of 'invested capital', however this might be measured, and the 'clean surplus' residual or goodwill.

In the following chapter the adapted Rappaport model used above will be used as a basis for developing an identity based on the seminal work of Feltham and Ohlson (1995) within the area of 'value relevance' studies. Using Linear Information Dynamics (LID) a model is developed that moves away from the clean surplus relation towards a holistic relationship between certain cash flow drivers and the value of the company. From this holistic model is developed a methodology in Chapter 9 for testing the relationship between changes in identified constituent cash flow drivers and changes in total market capitalization.

CHAPTER 8: VALUE RELEVANCE STUDIES AND THE DEVELOPMENT OF A TESTABLE MODEL

Introduction

Chapter 5 involved a review of accounting models from the accounting and financial management literature, where an attempt was made to accommodate the 'timing differences' or the 'goodwill' caused through the recognition of accounting profit under different underlying concepts as compared with economic income. Early accounting models such as economic profit were discussed leading to such measures as residual income (RI), earned economic income (EEI) and economic value added (EVA). In the previous chapter a free cash flow based valuation model such as the adapted SVA model of Rappaport was then justified and explained. This model is finally discussed using an original illustrative example and its concept of value as driven by seven key drivers linked to cash flow expectations.

This is a purer model than the accruals based accounting models and is more consistent with classic economic theory, highlighting the importance of the cash flow statement as a useful addition to accounting reports, from which investors can make assumptions about the capacity of the company to generate free cash and to create or destroy shareholder value.

In this chapter a testable model is developed based on research carried out in the late 1980s and 1990s on the value relevance of earnings and cash flows. The main contributors include Ohlson (1995), Feltham and Ohlson (1995), Board and Day (1989), Ali and Pope (1995), Clubb (1996), Garrod et al (1999) and O'Hanlon and Peasnell (2001). These papers explore variations of the (Edwards, Bell, Ohlson) EBO model first coined by Bernard (1995) and the clean surplus model, relating share price to book values plus discounted abnormal earnings.

The method used in this chapter is to firstly adapt the existing EBO model to the accruals based accounting model of shareholder value (EVA), Stewart (1991), and then to refine this again into a purer cash flow model based on the approach of Rappaport (1998) removing the distinction between accounting book values and the 'clean surplus'

Deriving an appropriate valuation model

The basic EBO valuation model also known as the residual income model (RIM) for the value of a share of a company is shown in the existing literature as follows:

$$P_t = bv_t + \Sigma^{\infty}_{\tau=1} (1+r)^{-\tau} E_t (x_{t+\tau} - r.bv_{t+\tau-1})$$

Where P_t = market value of share.

And bv_t = book value of share at time period t

E_t = expectations at time t

r = cost of equity capital

t = number of time periods in the horizon

x_t = earnings (Net operating profit after tax and depreciation)

Adapting the above to comply with the Stern and Stewart EVA model gives the following for the company as a whole:

$$MV_t = tbv_t + \Sigma^{\infty}_{\tau=1} (1+r_w)^{-\tau} E_t (x_{t+\tau} - r_w.tbv_{t+\tau-1})$$

Where MV_t = market value of company including long-term debt.

And tbv_t = total economic book value of all long term funds at time period t

E_t = expectations at time t

r_w = weighted average cost of capital

t = number of time periods in the horizon

x_t = NOPAT (Net operating profit after tax and depreciation)

The part of the identity $E_t(x_{t+\tau} - r.bv_{t+\tau-1})$ is NOPAT less the weighted-average cost of capital, which is described as EVA™, and discounted expected EVAs also equate to MVA™ Simplifying the expression, this equation can be restated as follows, removing the total book value of the company from both sides:

$$\mathbf{MVA_t = \Sigma^{\infty}_{\tau=1} (1+r_w)^{-\tau} E_t (x_{t+\tau} - r_w.bv_{t+\tau-1})}$$

Where MVA is equal to all discounted future expected EVAs at time t.

Economic theory suggests that using "ideal income *ex post*" at time t (Hicks, 1946), essentially gives the NPV of all expected free cash flows (not depreciated accounting earnings). This model originally used the free cash flow or dividends attributable to *shareholders*, discounted by the *cost of equity* less the *opening book value of the equity invested.* However, the model can also be adapted for an entity as a whole. In this model there is no periodic charge for depreciation as under EVA so the original book value of equity must be deducted from the present value to arrive at net present value (NPV). The NPV under this model is exactly the same as MVA, except that with MVA the original value of the investment is charged periodically against income as depreciation rather than deducted at the outset.

The above is explained through the following example originally used in Chapter 4.

Long term investors have invested £20,000 in Hicks Ltd and the expected free cash flows before interest and tax, available to long-term investors are forecast as follows: £4,000 at the end of year 1, £6,500 at the end of year 2, £7,500 at the end of year 3, and it is anticipated that the company could be sold for £10,800 at the end of the fourth year. The weighted-average cost of capital is 8%. The depreciation charge for the original investment is 25% every year.

Table 1: Valuation of Hicks Ltd using NPV

Time period	Cash flows (C)	Present values (Kt)	Present values (Kt-1)	Cost of capital* (Kw)	Clean surplus	Windfall or initial NPV
	(£)	(£)	(£)	(£)	(£)	(£)
1	**4,000**	21,022	23,169	1,853	2,147	3,169**
2	**6,500**	16,200	21,022	1,682	4,818	
3	**7,500**	10,000	16,200	1,296	6,204	
4	**10,800**	Nil	10,000	800	10,000	
Totals:	**28,800**			**5,631**	**23,169**	

* The cost of capital (Kw) is alternatively known as 'economic income' (Hicks, 1946)

** Windfall or initial NPV = (PV at the beginning of period 1 less the initial cost of the investment)

Where Kt = Capital at time t

The above table shows that the future cash flows, including the residual value, discounted by the cost of capital, are greater than the cash equivalent invested capital.

Essentially this is the discounted cash flow approach where a project is accepted or rejected if a positive NPV is yielded, and applied here to a company as a whole. Here the investment is worth undertaking. Note that under the EBO model the value of the company in any period is the value of Kt (end of year book value) plus the cumulative and realised clean surplus from each preceding period.

The table below shows periodic EVAs and discounts them by the weighted-average cost of capital in the right-hand column. Note that the sum of the discounted EVAs equals MVA being identical to the NPV arrived at in the first table.

Table 2: Valuation of Hicks Ltd using EVA™

Time period	**Cash flows (C)**	**Book values (Kt)**	**Book values (Kt-1)**	**NOPAT (CF - Depn)**	**Cost of capital (Kw)**	**EVA (NOPAT - Kw)**	**Discounted EVA**
	(£)	(£)	(£)	(£)	(£)	(£)	(£)
1	**4,000**	15,000	20,000	(1,000)	1,600	(2,600)	(2,407)
2	**6,500**	10,000	15,000	1,500	1,200	300	257
3	**7,500**	5,000	10,000	2,500	800	1,700	1,350
4	**10,800**	Nil	5,000	5,800	400	5,400	3,969
Totals:	**28,800**			**8,800**	**4,000**	**4,800**	**3,169**

Therefore, the original model can be restated as follows where the market value of a quoted company is equal to the cash invested capital plus expected future EVAs discounted by the weighted-average cost of capital:

$$MV_t = \Sigma^{\infty}_{\tau=1} (1+r_w)^{-\tau} E_t(EVA_t) + CI = £23,169$$

Where EVA = Economic value added per period

And r_w = rate of return required by all long- term lenders.

And CI = Capital invested by long-term investors

However as shown above, the model is equivalent in present value terms to the following:

$$\mathbf{PV_t = \Sigma^{\infty}_{\tau=1} (1+r_w)^{-\tau} E_t (C_t) = £23,169}$$

Where C = periodic cash flow

And therefore it simply is not necessary to separately identify the *clean surplus* and or the *invested capital* parts of the EBO expression, as normally disaggregated by the main researchers in this area to date. The reason for this is that earned accounting income or realised cash flows are irrelevant to the assessment of economic value, although they are inevitably a component of accounting book values.

This serves to simplify the model considerably, and avoids the need to estimate future EVAs, or to revalue annually the "economic book value" of the company, as recommended by Stewart (1991) in the numerous required adjustments to accounting book value. Essentially economic theory would obviate the need for an arbitrary split between realised earnings or book values and clean surpluses. As discussed above, the only meaningful comparison is between the originally invested or current market value of capital at the outset of an investment period and the present value of future cash flows, known traditionally as net present value. At any point in time therefore, the NPV of a company can be calculated as follows:

$$NPV_t = \Sigma^{\infty}_{\tau=1} (1+r_w)^{-\tau} E_t(CF_t) - CI$$

Essentially a positive NPV indicates that the shares are undervalued or should be bought or held. A negative NPV indicates the shares are over valued and should be sold.

Given that future net cash flows and not necessarily the separate components of book value and clean surplus earnings which determine value, then a free cash flow based derivative of the EBO model may be used in empirical research. To do so, it is necessary to obtain a testable contemporaneous version of the above using linear information dynamics (LID), Ohlson (1995). The above assumes that the value of a company at any point in time is simply a function of the present value of expected future cash earnings available to long-term investors.

Rappaport (1998) introduced the concept of shareholder value (SV). SV is essentially defined as the cumulative present value of annual free cash flows available to all long-term investors and the present value of the residual or terminal value of a company after adding the value of marketable securities and investments, and after subtracting the market value of debt.

Rappaport (1998) assumes that cash flows within an assumed forecast period of five years are a function of sales growth, operating margin, tax, *incremental* expenditure on working and fixed capital, and the weighted-average cost of capital. He also assumes that beyond the forecast period the company is expected to earn normal returns earning exactly the cost of capital, due to competitive dynamics (Rappaport 1998, pp. 41-42). For this reason even if growth is anticipated beyond the forecast period, the terminal part of the value of the company can be calculated using a perpetuity model with or without inflation. However, the model developed does not need to be adapted to incorporate the terminal value, as it already expresses SV_t as a function of the discounted present value of all cash flows. (It is irrelevant within this model whether the SV is a function of n years of discounted cash flows plus a

terminal value, or all discounted cash flows into perpetuity). The result will be the same as can be proved from a simplification of the dividend model equation.

Rappaport's original model is an entity based relationship where free cash flows (FCF) include interest and the weighted-average cost of capital is used. Shareholder value in the original model is arrived at by adding the value of marketable securities and investments and subtracting the market value of debt.

Rappaport's original model can be stated as follows:

$$\mathbf{SV_t = \Sigma^{\infty}_{\tau=1} (1+r_w)^{-\tau} E_t(FCF_t) + MSI - MVD}$$

Where FCF_t = free cash flow in each period before interest after fixed and working capital expenditure

And r_w = weighted average cost of capital

MSI = value of marketable securities and investments

MVD = market value of long-term debt

The above entity-based model can be adapted to an equity-based model by using adjusted present value (APV) by assuming that FCFs are after interest has been paid, and that the cost of equity is used as the discount rate.

Adapting the valuation identity to an equity-based model gives the following:

$$\mathbf{SV_t = \Sigma^{\infty}_{\tau=1} (1+r_e)^{-\tau} E_t(FCF_t) + MSI}$$

Where: r_e = cost of equity

And where FCF would be after cash outflows for servicing long term lending.

Therefore this is an equity based model excluding MVD and arrives at SV directly:

In the analysis already undertaken and linked to Rappaport's model, shareholder value or market capitalisation is assumed to be a function of free cash flows available to shareholders *plus the value of marketable securities and investments (MSI).* However this additional component in Rappaport's model is unnecessary as the intrinsic value of such investments would normally already be included within the components of FCF as dividends and interest receivable from investments, found within the returns on investment and servicing of finance section of the cash flow statement. Therefore the above model can be further simplified as follows eliminating the MSI variable:

$$SV_t = \Sigma^{\infty}_{\tau=1} (1+r_e)^{-\tau} E_t(FCF_t)$$

Also in Rappaport's original model the cash flows used were after charging for normal working capital requirements and depreciation. In this model we will adopt the pure approach and define FCF as cash flow *before* depreciation but after interest, tax, and *all* working and fixed capital expenditure.

In order to convert the above into a testable empirical model, just as in Ohlson's (1995) clean surplus identity, it is possible to derive a simple fundamental economic relationship using LID which links SV to FCF contemporaneously at the end of any particular accounting period.

$$SV_t = \alpha_o + \alpha_1 FCF_t + \varepsilon_t \qquad \text{(Expression 1)}$$

The intercept is present to reduce problems due to model mis-specification or unaccounted for variables.

The intercept could be positive or negative as changes in the shareholder value of the company could be affected by non-company specific cash flow drivers and determined partially by macro factors such as discussed in Chapter 4 like fiscal policies, interest rates and general economic and stock market conditions. In other words even if there were no relationship between company cash flow performance and market capitalisation overall, market values could change as a result of systematic factors. The error term is included to capture any residual causality not already impounded into the main variables.

The above model is the basic formulation, using LID from which a decomposition of the cash variables driving SV will be derived. As explained above, unlike the Ohlson or similar models, there is no *artificial split* of value within the right hand side (RHS) of the above expression between the book value element, and the clean surplus or abnormal earnings element, net of the cost of capital.

However, in contrast with the Ohlson model, being a contemporaneous single period relationship of share price as a function of current earnings and book value, this thesis concentrates on *changes* in value as a function of *changes* in free cash flows. This is consistent with the SVA model where the shareholder value added is being measured. This type of analysis seems to be lacking in the literature on value relevance although Liu and Thomas (1999) do compute such a measure and show that the correlation with contemporaneous returns increases dramatically.
Expression 1 is therefore restated as follows:

$$\Delta SV_t \text{ or } SVA = \alpha_o + \alpha_1 \Delta FCF_t + \varepsilon_t$$

As with (Ohlson, *op cit*) the earnings number in the basic valuation identity could be decomposed into cash flow and accruals components (Garrod *et al,* 1999).

Under this methodology the free cash flows will also be decomposed, but in a different way and consistent with the main value drivers as identified by Rappaport (1998). These drivers can also be obtained from the constituent elements of FRS 1 (Revised) 1996.

The next modification to the model is to decompose FCF_t in the right-hand side of the model as follows:

Defining:

$$\mathbf{SV = OM - (\Delta st + \Delta dr - \Delta cr) - (R + T + CE)} \quad \text{(Expression 2)}$$

Where: OM = operating margin before interest tax and depreciation

And: Δ st = change in stock level

Δ dr = change in debtors

Δ cr = change in creditors

R = returns on investments and servicing of debt finance

T = tax cash flow

CE = cash capital expenditure on internal and external fixed asset investments

Defining:

$$\mathbf{(\Delta st + \Delta dr - \Delta cr) = \Delta WC} \quad \text{(Expression 3)}$$

Where WC = working capital cash flow

WC is one of the main cash value drivers as classified by Rappaport (1998)

Substituting Expression 3 into Expression 2 (consolidating WC) and giving the changes as between one period and the next gives the following:

$$\mathbf{SVA} = \alpha_0 + \alpha_1 \Delta\mathbf{OM} - \alpha_2 \Delta\mathbf{WC} - (\alpha_3 \Delta\mathbf{R} + \alpha_4 \Delta\mathbf{T} + \alpha_5 \Delta\mathbf{CE}) + \varepsilon_t \quad \text{(Expression 4)}$$

Defining:

$$\mathbf{OM} = \mathbf{S} - \mathbf{E} \quad \text{(Expression 5)}$$

Where S = Sales

And E = Operating expenses (excluding depreciation and interest)

Substituting (5) into (4)

$$\mathbf{SVA} = \alpha_0 + \alpha_1 \Delta\mathbf{S} - \alpha_2 \Delta\mathbf{E} - \alpha_3 \Delta\mathbf{WC} - (\alpha_4 \Delta\mathbf{R} + \alpha_5 \Delta\mathbf{T} + \alpha_6 \Delta\mathbf{CE}) + \varepsilon_t \quad \text{(Expression 6)}$$

Defining:

$$\mathbf{CE} = \mathbf{ICE} + \mathbf{ECE} \quad \text{(Expression 7)}$$

Where ICE = internal cash capital expenditure (on producing or acquiring individual separable tangible or intangible assets)

And: ECE = external cash capital expenditure (on mergers, acquisitions, associates, investments, and joint ventures)

Substituting (7) into (6):

$$\mathbf{SVA} = \alpha_0 + \alpha_1 \Delta\mathbf{S} - \alpha_2 \Delta\mathbf{E} - \alpha_3 \Delta\mathbf{WC} - (\alpha_4 \Delta\mathbf{R} + \alpha_5 \Delta\mathbf{T} + \alpha_6 \Delta\mathbf{ICE} + \alpha_7 \Delta\mathbf{ECE}) + \varepsilon_t$$

(Expression 8)

It could be argued that dividends should be excluded from the model as a constituent cash flow because, according to Modigliani and Miller (1961), dividends are not value relevant and are in any case a part of the free cash flows available to shareholders discounted to obtain shareholder value. However, in case dividends exert a possible NPV effect on SV, the dividend variable is added as a possible determinant of periodic changes in shareholder value.

$$\mathbf{SVA} = \alpha_0 + \alpha_1 \Delta S - \alpha_2 \Delta E - \alpha_3 \Delta WC - (\alpha_4 \Delta R + \alpha_5 \Delta T + \alpha_6 \Delta ICE + \alpha_7 \Delta ECE) - \alpha_8 \Delta D + \varepsilon_t$$

Where D = dividends paid

It can be argued that SVA should also be a function of any new equity capital raised from shareholders or redeemed within the period. This is only the case where the NPV of the new investment or redemption has a positive or negative NPV impact on the company. It could also be argued that changes in gearing through the issue or redemption of long term debt might also have a positive or negative NPV effect on the company's shareholder value, although this is not borne out by conventional finance theory (Modigliani and Miller, 1958). So as a final step changes in financing will be added as the last variable in the expression below:

$$\mathbf{SVA} = \alpha_0 + \alpha_1 \Delta S - \alpha_2 \Delta E - \alpha_3 \Delta WC - (\alpha_4 \Delta R + \alpha_5 \Delta T + \alpha_6 \Delta ICE + \alpha_7 \Delta ECE) - \alpha_8 \Delta D + \alpha_9 \Delta F + \varepsilon_t$$

Where:

F = debt and equity finance raised (variable 9 would be negative if repaid)

The methodology to be adopted is to undertake a multiple linear regression of the nine independent variables influencing SVA, the dependent variable.

However, to simplify the model somewhat and adapt it better to information easily obtained from the cash flow statement, ΔOCF can be substituted for ($\alpha_1 \Delta S - \alpha_2 \Delta E - \alpha_3 \Delta WC$). The final model is shown below:

$$\mathbf{SVA = \alpha_0 + \alpha_1 \Delta OCF - (\alpha_2 \Delta R + \alpha_3 \Delta T + \alpha_4 \Delta ICE\ \alpha_5 + \Delta ECE) + \alpha_6 \Delta D + \alpha_7 \Delta F + \varepsilon_t}$$

Where OCF = operating cash flow

This final testable model has now been adapted to the cash flow statement as required under FRS 1 (revised) and also uses variables available in IAS 7

The model attempts as far as possible to decompose the main model into variables (shareholder value drivers) as identified by Rappaport, and which include all the headings as obtained in FRS 1 (revised).

Variable $\alpha_1 \Delta$OCF is found at the top of the cash flow statement and derived from the reconciliation of profit to cash flow.

Variable $\alpha_2 \Delta R$ is obtained in the returns on investments and servicing of finance section of the cash flow statement

Variable $\alpha_3 \Delta T$ is obtained in the taxation section of the cash flow statement

Variable $\alpha_4 \Delta$ ICE is obtained in the fixed or long-term asset sub-section of investing activities in the cash flow statement.

Variable $\alpha_5 \Delta$ ECE is obtained in the acquisitions sub-section of investing activities in the cash flow statement

Variable $\alpha_6 D$ is obtained from the equity dividends paid section of the cash flow statement

Variable $\alpha_7 F$ is obtained from the financing section of the cash flow statement

The research aims to assess empirically the relative explanatory powers of changes in any or all of these seven cash flow variables between the beginning and the end of a financial period over SVA or the change in market capitalisation over the same period. The pilot survey will include all surviving FTSE 100 companies over a three-year period starting in 1999 to 2001. SVA will be measured as the change in market capitalisation from the beginning to the end of each of the two periods.

The hypothesis put forward in this thesis is that changes in constituent cash flows from one period to another may have a statistically significant effect on movements in total market capitalisation. The model is intended to test the effect the variables may have upon the change in market capitalisation. The model is intended to test whether cash flow 'drivers' including those identified by Rappaport build shareholder value directly, or destroy value.
For example, some forms of revenue expenditure like research and development, advertising and promotion, operating lease expenditure, and capital expenditure on external and internal investments may build rather than destroy value within the model. This could indicate that as with many cash flow models, there may be models lying within models like a hall of mirrors.

The relationship between changes in shareholder value and changes in debt and equity in financing activities may be informative. According to the linear model, an increase in issued cash equity has a £ for £ effect on total shareholder value as it would normally add equally to book and market values. Although, as explained in Chapter 6, it is anticipated in accordance with previous research, that changes in debt should have little if no effect on shareholder value, a net change in cash equity or debt financing could have a negative or positive effect as a consequence of the signals that such investments or re-purchases/redemptions might send out to the market.

Conclusions

This chapter has developed an adapted approach to value relevance theory. Most of the contemporary research in this area originating from Ohlson, attempts to use the EBO model and the clean surplus relationship to explain correlations between earnings, book values, and share prices.

This chapter explains that the distinction between accounting or economic book values and clean surplus earnings is possibly an irrelevance in assessing causal relationships between financial performance and shareholder value. It is argued that in economic terms the market capitalisation should represent the discounted present value of all future net cash flows attributable to equity shareholders. Therefore, in theory, changes in constituent cash flows and expectations of these changes should determine changes in shareholder value. The model developed in this chapter adapts Rappaport's shareholder value added approach, where shareholder value is driven by a number of key cash flow drivers. These drivers are sales less expenses, taxation, working capital and fixed capital requirements, and financing activities. Rappaport also recognised the cost of capital (cost of equity) as a driver of value. However, using the above model, the cost of capital is ignored as a value driver and monetary unadjusted cash numbers are to be used for the empirical study as is the case with other value relevance empirical research models.

This chapter has therefore derived a testable model from the basic EBO identity, using linear information dynamics, where SVA is expressed as a function of positive or negative cash flow change variables. The methodology adopted in the next chapter will use the financial reports of the surviving FTSE 100 companies over three reporting periods since the introduction of FRS 1 (revised), and apply multiple regression techniques to test for any significant causal relationship between the changes in constituent cash flows and any changes observed in the market capitalisation between the beginning and the end of the accounting period.

In Chapter 9 the specific methodology adopted for this thesis is fully explained.

CHAPTER 9: METHODOLOGY

Introduction

In the previous chapter a testable model was developed from a normative perspective explaining the relationship between the total market value (market capitalisation) of a quoted company and key constituent cash flow drivers as reported in the cash flow statement. This testable model was developed on the basis of seminal work first undertaken by Feltham and Ohlson (1995) and other researchers in the area of "value relevance". The model was converted from the EBO "clean surplus" to a "holistic" identity, using linear information dynamics (LID).

Unlike the Feltham and Ohlson (1995) research and similar studies referred to in the previous chapter, which attempted to measure the relationship of accounting book values as a net stock of resources and earnings with company valuation, it was argued that book values and clean surplus earnings as separate components of the present value of a company shouldn't be individually relevant according to economic theory. Indeed several studies including Collins, Maydew and Weiss, (1997), and Strong (1993) all argue that the explanatory power of reported earnings have declined over at least the last two decades. Brief and Zarowin, (2000) argue that accounting book values are only a good proxy or predictor of value when earnings are transitory and unreliable.

In the previous chapter, building on from economic arguments developed in Chapter 4 onwards, it was argued that holistically and from a normative standpoint, the value of a company should be a function of expected discounted total net cash flows after interest and tax, including income from marketable securities and investments over the foreseeable economic life of the entity, discounted by the cost of equity.

It has therefore been argued, that over a single 12-month horizon, changes in key cash flow constituents could in theory act as better signals of changes to a company's intrinsic value, than changes in accounting earnings or book values as separate components, as long as the stock market and investors within that market behave rationally from a normative economic perspective.

In this chapter the method for testing the model derived in the previous chapter will be explained and justified. The model will be tested using the multiple linear regression technique involving the selection of the best predictors from a set of variables that from the previous chapter were argued to be most relevant. These variables were derived in the previous model as having a theoretical direct relationship with the value of a company from economic theory and applied financial management.

Testable model

The testable model arrived at (from Chapter 8) is as follows:

$$\mathbf{SVA = \alpha_o + \alpha_1 \Delta OCF - (\alpha_2 \Delta R + \alpha_3 \Delta T + \alpha_4 \Delta ICE\ \alpha_5 \Delta ECE) - \alpha_6 \Delta D + \alpha_7 \Delta F + \varepsilon_t}$$

In conventional statistical notation this can be re-expressed as:

$$\mathbf{Y_t = b_0 + b_1 x_{1t} + b_2 x_{2t} + b_3 x_{3t} + b_4 x_{4t} + b_5 x_{5t} + b_6 x_{6t} + b_7 x_{7t} + e_t}$$

The above model states that in theory there should be a linear relationship between the dependent variable (Y) and the seven independent (X) variables. There is also an intercept term to allow for the possibility of the line of best fit not going through the origin. In other words there is the

possibility, as discussed in Chapters 3 and 6, that wider systematic macro factors such as general economic and market conditions may affect the FTSE 100 index which are totally unrelated to the company specific and unsystematic cash flow factors as measured within the model above. Finally, as in most such models of this nature, there is an error variable included known as the random disturbance.

The methodological approach for this research was to test the ability of the linear model derived in Chapter 8 to explain the relationship between the changes in shareholder value (SVA) or market capitalization of a company with independent changes in cash flow drivers as identified by Rappaport (1986) and obtained from a company's cash flow statements.

Statistical technique adopted for empirical testing

Multiple regression as a technique is widely used in accounting, scientific and behavioural research as a useful methodology for breaking down and measuring the separate effects of the independent variables on a dependent variable and even for using measures of the independent variables and their changes to help predict changes in a dependent variable. Some researchers in effect use a form of data mining where the effects on a dependent variable are measured by adding in to an effectively empty model, progressively more independent variables to improve the overall statistical significance of the model. This is known as *forward selection.* A variation on this is *stepwise regression* also starting with an empty model and progressively adding in independent variables, except that this method offers more flexibility in allowing for the removal of independent variables from the model if they become non-significant after other new variables are added.

A third technique used in the multiple linear regression method is *backward elimination.* This is the method used in this pilot study as a testable model has already been derived from a normative approach to assessing the relationship between cash flow changes and SVA.

Having derived the testable model in Chapter 8 the seven cash flow variables (or drivers) are therefore assumed from a normative standpoint to have a *nominal* effect on market value.

The backward elimination fits in logically with the approach taken in this research as it involves starting the analysis from a full model where all the independent variables have been identified and are introduced together into the equation and tested against the dependent variable. Under this technique the least significant variable statistically, is removed from the model until a point is reached where all remaining variables are *nominally* statistically significant (within the parameters set). Backward elimination has an advantage over forward selection and stepwise regression because it is possible for a set of variables to have considerable predictive capability even though any subset of them does not. Forward selection and stepwise regression will fail to locate this set, (Dallal, 2003). Because they don't predict well individually, the variables will never get to enter the model to have their joint behaviour noticed. Backward elimination on the other hand starts with everything in the model, so their joint predictive capability will be observed.

The methodology used in the investigation is therefore to apply backward elimination in an already populated linear multiple regression model. Using 'Microsoft Excel Analysis' all the data collected for all the variables included in the above model would be statistically tested. As explained in the previous chapter, just as it is possible to regress absolute variables against each other it is just as straightforward and perhaps more helpful to use change variables rather than absolutes. This point is illustrated using an example adapted from Excel help, explaining the LINEST function in Table 1 below:

Table 1: LINEST function - Estimation of the value of a house (absolutes)

Square metres	Bedrooms	Garden in hectares	Age in years	Value (£k)
X1	X2	X3	X4	Y
2310	2	2	20	142
2340	2	2	12	144
2360	3	1.5	33	151
2370	3	2	43	150
2400	2	3	53	139
2420	4	2	23	169
2450	2	1.5	99	126
2465	2	2	34	143
2490	3	3	23	163
2500	4	4	55	169
2540	2	3	22	149

SUMMARY OUTPUT

Regression Statistics	
Multiple R	1.00
R Square	1.00
Adjusted R Square	1.00
Standard Error	1.18
Observations	11.00

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	4.00	4037.09	1009.27	719.90	0.00
Residual	5.00	7.01	1.40		
Total	10.00	4044.10			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1.33	1.44	-0.92	0.40	-5.04	2.37	-5.04	2.37
X Variable 1	0.08	0.06	1.30	0.25	-0.08	0.23	-0.08	0.23
X Variable 2	12.80	0.41	31.05	0.00	11.74	13.86	11.74	13.86
X Variable 3	2.98	0.55	5.45	0.00	1.58	4.39	1.58	4.39
X Variable 4	-0.23	0.01	-21.89	0.00	-0.26	-0.21	-0.26	-0.21

Table 2: LINEST function - Estimation of the value of a house (differences)

Square metres X1	Bedrooms X2	Garden in hectares X3	Age in years X4	Value (£k) Y
30.0	0.0	0.0	-8.0	2.0
20.0	1.0	-0.5	21.0	7.0
10.0	0.0	0.5	10.0	-1.0
30.0	-1.0	1.0	10.0	-11.0
20.0	2.0	-1.0	-30.0	30.0
30.0	-2.0	-0.5	76.0	-43.0
15.0	0.0	0.5	-65.0	17.0
25.0	1.0	1.0	-11.0	20.0
10.0	1.0	1.0	32.0	6.0
40.0	-2.0	-1.0	-33.0	-20.0

SUMMARY OUTPUT

Regression Statistics	
Multiple R	1.00
R Square	1.00
Adjusted R Square	0.99
Standard Error	0.97
Observations	10.00

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	4.00	1731.12	432.78	463.19	0.00
Residual	6.00	5.61	0.93		
Total	9.00	1736.73			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	50.94	12.35	4.13	0.01	20.73	81.14	20.73	81.14
X Variable 1	0.03	0.01	5.16	0.00	0.01	0.04	0.01	0.04
X Variable 2	12.63	0.40	31.76	0.00	11.66	13.61	11.66	13.61
X Variable 3	2.64	0.52	5.12	0.00	1.38	3.90	1.38	3.90
X Variable 4	-0.23	0.01	-17.76	0.00	-0.26	-0.20	-0.26	-0.20

Table 2 takes *the differences* between the 11 absolute data entries in Table 1 and expresses all the remaining 10 data items in terms of their differences rather than in their absolute values. As can be seen, the output formula is almost identical, with only the constant being significantly different as would be expected. The minor differences between the independent X variables in each table is

wholly attributable to the lower number of data entries, i.e. 10 not 11. Note also that unlike with Table 1 all P-values including the intercept are now significant.

The above example serves to illustrate that it is as statistically valid to use change variables instead of absolutes within a regression function as the slope coefficients of the X variables may not be materially affected either way. The advantage of this modification is that it may be a clearer and more direct way of analyzing and presenting the impact of various constituent cash flows on changes in the total market value of a given company in this type of research and in any case is consistent with using SVA as the independent Y variable.

Selection of the sample population

The initial intention was to take as large a sub-set of the FTSE 100 companies on the grounds that these are the companies traded most heavily on the London stock market and to whose financial performance most investor and analyst attention is devoted. The FTSE 100 was also selected as the population because it comprises the largest quoted companies on the UK stock exchange and because financial data on these companies is so easily and widely available to researchers and investors alike.

Although the original boundary of the pilot study was to span the years 1997 to 2001, it became clear that not all cash flow and market capitalization data was available for all these companies over all four years from the databases available on the Open University Library. As the sample of this population was to be as large as possible for maximum statistical significance, it was decided to include within the same sample, companies with year-ends at different dates and only measure the applicability of the model over the financial period for which the data for most of these companies was available. This happened to be 2000 to 2001, when data for 64 of the FTSE 100 companies could be obtained.

Only data from 1999 –2001 was available at the time of this study because it was only in these years that FRS 1 (revised) cash flow data in the form usable in the analysis was available. Data was obtained from the FAME database available on-line from the Open University virtual library. The 64 companies selected are shown in Appendix 1:

Method used

The methodology involved initially using relevant data from the cash flow statements of the selected companies for the two periods of 2000 and 2001. In effect the time span being observed ranged from measuring changes in cash flows from January 1 2000 to 31 December 2001. The cash flow data covering two financial periods were needed to measure the change between one period and the next. It was for only the above 64 of the FTSE 100 companies, that share price and security information covering the relevant accounting periods, was available to correspond with the two years of cash flow data available.

Having originally intended to perform the regression analysis on cash flow changes on a per share basis to avoid potential heteroscedasticity problems, it became apparent, after the sample had been derived and cash flow data obtained, that FAME didn't publish the number of ordinary shares issued under the balance sheet or securities information within its database. At this point it was decided (despite possible statistical issues) to use changes in the total market value or SVA and not share prices as the dependent variable Y, and for consistency to use total cash flow changes as the X (dependent) variables. However, FAME does not disclose total market capitalization numbers, so another database was therefore needed. Following a discussion with the Open University Library it was possible to access Lexis Nexis Executive – a company database. By selecting company search (world scope) it was possible to obtain in $US'000 the opening and closing market capitalization of all the 64 companies within the sample already

selected. Using Historic exchange rates from http://Fxtop.com/en/historates.php3 it was possible to translate all the market capitalization data at the relevant dates into £GBP.

Selecting the cash flow data

Selecting the data from the cash flow statements involved having to use two cash flow statements covering two financial periods to obtain the changes. The year-end of the companies within the original sample varied, but it was possible to calculate for all the seven X variables, changes in cash flow from the one year to the next. For example if cash flow from operating activities was £5m in year 1 and £4m in year 2 the data entered in the spreadsheet cell for that variable and for that particular company was -£1m. This was calculated for all seven variables contained within the model for each company within the sample. For financing activities, no distinction is made between financing from debt or equity as per the model previously derived, and therefore changes in this variable (X_7) would be a combination of debt and or equity raised and/or redeemed and no distinction in this pilot survey was therefore made. The Y (dependent) variable was obtained by taking the difference between market capitalization at the year-end as compared with the beginning of the year, as translated in £GBP, which of course is SVA.

Assumptions

It was assumed that as stock markets are fairly efficient according to the efficient market hypothesis (Fama, 1965), insofar as analysts and investors use this information, changes in cash flows and knowledge of these would be impounded in the share price and therefore in the market capitalization of the company within and by the end of the 12-month calendar period, and assumed there would not be any information or reaction lag to announcements or to the published figures that might distort the findings.

It was also assumed that changes between constituent cash flows between one financial period and the next should be regressed against the difference between the year-end market capitalisation of the companies for those two financial periods.

It was also assumed that market capitalization would be translated from $USD to £GBP at the closing rate for all companies applying at the relevant balance sheet dates.

Method of analysis

Microsoft Excel and the "Data analysis" function under the Tools menu were used to analyze the data. The regression function (linear mode) was used and an ANOVA table was displayed giving the key statistical information required. Backward hierarchical stepwise multiple regression or (backward elimination) was used to calculate ordinary least squares (OLS) in discrete stages, as the model developed in Chapter 8 had specified in theory (from a normative perspective) what the significant independent variables should be at the outset.

As stated above, from a hypothetical perspective it was decided not to use the forward step-wise regression model in this analysis, as might be used in exploratory research or in data mining. Backward elimination was used as it has an advantage over forward selection (Dallal, 2003) because it is possible for a set of variables to have considerable predictive capability even though any subset of them does not.

For the above reasons it was therefore decided to observe the results with all seven variables in the model initially, assessing how significant they all were individually and collectively in explaining variations in Y, and then to remove one by one, those variables not shown as statistically significant within the model, until all remaining variables satisfied the F significance and T statistics within the probability parameters set. It was decided to use 95% confidence limits to test the model.

Multi co-linearity

A common statistical problem with the use of linear multiple regression techniques is the issue of interdependence or multi-co-linearity between independent variables which can distort findings. For example, in the testable model both cash tax changes and changes in net cash flow from operations have been identified as cash flow drivers. However, it is likely that changes in cash flows generated from operations will have an effect on changes in tax cash flow, i.e. a reduction in cash flow from operation should lead to a reduction in the cash flow from taxation (ignoring timing differences). Another example is changes in cash expenditure on fixed or long-term assets and cash changes in financing. Intuitively it can be assumed that these two independent variables should have an inversely proportional effect on the other, i.e. a cash outflow related to more expenditure on long-term asset acquisitions would normally be accompanied by a cash in-flow from financing.

The key effects of the multi-co-linearity of the dependent variables was measured after running the first regression in each sample using the covariance function of the *analyse* function on Microsoft Excel to observe the extent of this problem before drawing any conclusions.

Further validation tests

Having initially used the 64 companies selected in a cross-sectional analysis for the reasons given above, it was recognized that further tests and longitudinal cross-validations would be required to test if the findings with respect to the FTSE 100 population could be repeated over different periods. One of the potentially distorting factors of the original sample was the fact that the sample contained companies with different year-end months. This could be construed as a distorting factor, particularly in the fast changing financial climate between the end of 1999 and the end of 2001. For this reason it was then decided to select from this sample, all companies with the same and most frequent year-end date and perform the equivalent analysis on this sub-set of

the population. It is recognized that this form of analysis known as *data splitting is* rarely used due to the possibility that this approach leads to a loss in power (or ability to detect or verify effects) from only working with one subset of the data. However, this approach is justified in this research because the loss of power of working with sub-sets is compensated for by using samples of the data with common characteristics such as analyzing all those companies with the same year-end data and/or then comparing the same sub-set over different periods to make a temporal or longitudinal comparison.

It was found that 31 December was the most popular year-end date and 35 of the 64 companies for which the necessary data was available, had the same year-end date. These were selected and the equivalent analysis undertaken.

Finally it was decided to cross-validate the results of these same 35 companies by comparing the results of the model with the preceding period to see if results could be replicated over consecutive periods. Due to some gaps in the cash flow data, only 32 of the 35 selected companies had cash flow data from the preceding period of 1 January 1999 to 31 December 1999. However, data from these 32 companies were also tested using the same methodology.

Finally for all the three sample sets of data, a *standard elasticity test* was undertaken to establish the relative weightings of the remaining significant X variables within each model, to measure which, if any, of these variables had the biggest relative proportional financial impact on Y.

Conclusions

This chapter has explained a methodology for empirically testing the model derived from a normative approach to valuing a company, from a cash flow perspective, in the previous chapter. Justification was given for selecting the population to be tested and for the various samples chosen from that population. An explanation was also given of how the data would be analyzed including the use of backward step-wise elimination under linear multiple regression and measuring for multi co-linearity. Finally, justification for undertaking tests of additional sub-samples using a *data splitting* approach was given, in order to validate and cross check findings initially obtained in the larger pilot study and to see if any results could be replicated longitudinally with these sub-sets.

CHAPTER 10: ANALYSIS OF RESULTS AND FINDINGS

Introduction

In this chapter the results of the multiple regressions from a pilot study of the 64 FTSE companies and two sub sets of these companies using the methodology explained in Chapter 9 will now be presented. The multiple regression data will be shown in the appendices and the *backward elimination* step-wise outputs from the ANOVA tables using *Tools* function and *Data Analysis from Microsoft Excel*™ will be included and discussed here in the main body of this chapter.

Testing the main pilot sample

The pilot study sample included 64 companies of the FTSE 100 for which individual share price information was available in FAME to correspond with the latest two years of cash flow data used. The period for which most data (i.e. for these 64 companies) were available was from January 1 2000 to December 31 2001, covering two calendar years.

The 64 companies and the original cash flow data and changes in market capitalisation are given in Appendix 1:

As explained in the previous chapter, the method of linear multiple regression adopted in this investigation, given the development of a normative model in Chapter 9, was to use the backward elimination method, starting with a fully populated model with seven independent X variables and the one independent Y variable.

These are listed below:

Dependent variable:

Y- Change in market capitalization in cash monetary terms over 12 months (SVA)

Intercept and Independent *coefficient x variables:*

(a_0) – Intercept

(a_1) X1 – Change in net cash flow from operations between the prior and consecutive periods

(a_2) X2 – Change in the net cash flow from servicing of finance and from investments between the prior and consecutive periods

(a_3) X3 – Change in the net cash flow from taxation between the prior and consecutive periods

(a_4) X4 – Change in the net cash flow from internal capital investment and disposals between the prior and consecutive periods

(a_5) X5 – Change in the net cash flow from external fixed capital investments and disposals between the prior and consecutive periods

(a_6) X6 – Change in the net cash flow from paying dividends between the prior and consecutive periods

(a_7) X7 – Change in the net cash flow from financing between the prior and consecutive periods

Hypotheses

The null hypothesis is that no significant statistical relationship exists between the dependent variable and any of the independent variables. In other words, any changes in the independent variables should have no statistically significant effect individually or collectively on the dependent variable and therefore that the intercept coefficient and the slope coefficients of each of the seven coefficient estimates are individually equal to zero. The null hypotheses are:

H_0 $a_0 = 0$

H_0 $a_1 = 0$

H_0 $a_2 = 0$

H_0 $a_3 = 0$

H_0 $a_4 = 0$

H_0 $a_5 = 0$

H_0 $a_6 = 0$

H_0 $a_7 = 0$

Each of these null hypotheses can be tested with a two-tail test. As can be seen from Appendix 2 (Table of t-statistics) the critical value of the t distribution in this case is 2.00 at the significance level of 5% with 56 (64-8) degrees of freedom (i.e. a confidence level of 95%).

An alternative way to approach testing the individual hypotheses above is to look at the p-values. Any p-value that is less than the level of significance selected (in this case 5%) then the null hypothesis is rejected. Under *backward elimination* if any of the variables have a p-value of less than 0.05 then the null hypothesis is rejected with respect to those independent variables and the variable with the highest p-value is eliminated from the model and the regression run again with the remaining variables.

The alternate hypothesis or H_A is that all of the independent variables have non-zero coefficients, signifying that all of the independent variables could have a significant positive or negative relationship with the dependent variable Y.

In more precise terms the alternate hypotheses are as follows based on the testable model arrived at in Chapter 8 are shown below in Table 1 below:

Table 1: Alternate hypotheses and variable labels

Independent X variables	**Hypothesised sign (+ or -)**	**Variable abbreviation in ANOVA**
a_0 Intercept	+ or -	Intercept
X1 Net operating cash flow	+	OCF
X2 Net operating cash flow from investments or for the servicing of finance	+ or -	ROI
X3 Net tax cash flow	-	TAX
X4 Net cash flow on internal capital investment and disposals	-	ICE
X5 Net cash flow on external capital investment	-	ECE
X6 Net cash flow on dividends	-	DIV
X7 Net cash flow on or from financing	+ or -	FIN

The null hypothesis was that the intercept should be zero in that there should be no systematic sector or market wide influences on the stock market based on economic, fiscal, or other macro factors as discussed in Chapter 3 and Chapter 6. The assumption behind this is that where there are no changes in the independent variables due to company specific cash flows, there should be no overall change in the market capitalization of the population due to wider factors.

The alternate hypothesis is that there are systematic macro factors extraneous to the cash flow performance of individual companies that have an overall value creating or destructive effect on the FTSE index as a whole. For example, the intercept would be assumed to be non-negative, i.e. positive in a 'bull' market or negative in a 'bear' market.

Running the multiple linear regression output for this pilot sample including all seven independent variables produces the ANOVA table as shown in Table 2 below

Table 2: (Regression 1 Pilot sample)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.89
R Square	0.80
Adjusted R Square	0.77
Standard Error	5879.73
Observations	64.00

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	7.00	7675172405.19	1096453200.74	31.72	0.00
Residual	56.00	1935987888.80	34571212.30		
Total	63.00	9611160293.99			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-139.66	782.57	-0.18	0.86	-1707.34	1428.02	-1707.34	1428.02
OCF (X1)	1.01	0.92	1.10	0.28	-0.83	2.85	-0.83	2.85
ROI (X2)	-28.91	8.69	-3.33	0.00	-46.32	-11.50	-46.32	-11.50
TAX (X3)	-6.74	5.10	-1.32	0.19	-16.95	3.47	-16.95	3.47
ICE (X4)	0.63	0.77	0.81	0.42	-0.92	2.17	-0.92	2.17
ECE (X5)	-2.37	0.72	-3.28	0.00	-3.82	-0.92	-3.82	-0.92
DIVS (X6)	4.64	6.58	0.71	0.48	-8.53	17.82	-8.53	17.82
FIN (X7)	-1.19	0.95	-1.26	0.21	-3.09	0.71	-3.09	0.71

An R squared and adjusted R squared shows how much significant correlation exists between the values of the X (a) variables in general and the Y variable. A value of 1 shows perfect correlation, so an adjusted R squared of 0.77 is quite high for such a sample. The most highly significant variable amongst those in Table 1 is indicated in the probability or p-values. Any values showing greater than 5%, being the significance parameter selected, show no clear influence of that particular X variable on the Y variable. The only two variables that reject the null hypothesis are X2 (cash flow changes in returns on investments and servicing of finance) and variable X5 (cash changes in expenditure on or disposals of external fixed asset investments) both with negligible p-values and t-statistics of –3.33 and -3.28 respectively. Under *backward elimination* it is required that the variable with the least significance is withdrawn from the data set and the regression re-run.

Multi co-linearity

In order to test the validity and robustness of this overall relationship it is useful to do a correlation test on these variables to see if multi-co linearity exists between the independent variables which might have a distorting effect on the model as a whole. This is carried out in Table 3 below.

Table 3: Multi co-linearity within Sample 1 using the correlation function in Excel

	OCF (X1)	ROI (X2)	TAX (X3)	ICE (X4)	ECE (X5)	DIVS (X6)	FIN (X7)
OCF (X1)	1						
ROI (X2)	0.064224	1					
TAX (X3)	-0.01261	-0.27517	1				
ICE (X4)	-0.3041	-0.20764	0.593698	1			
ECE (X5)	0.247555	0.112064	-0.68919	-0.78731	1		
DIVS (X6)	0.082931	0.604768	-0.34711	-0.02153	0.248817	1	
FIN (X7)	-0.15491	0.234847	0.485562	0.441178	-0.84293	-0.10546	1

As can be seen above, only two sets of the variables seem to exhibit any co-linearity and these are X4 (ICE) and X5 (ECE) which are negatively correlated at almost 0.79 which is just outside the range of statistical significance for multi co linearity (generally assumed at greater than 0.8). The most correlated pair is X5(ECE) and X7 (FIN) which is almost perfectly negatively correlated at –0.84. These findings are not surprising however, as companies tend either to grow organically or inorganically. They will grow, either through the acquisition of or investment in other companies, or through the purchase or production of internal fixed (long-term) asset investments within the business itself. The negative correlation confirms this hypothesis as does the negative correlation between financing and external fixed asset investment as companies deciding to grow by acquisition would normally need to do this through raising long-term finance.

Continuing the analysis, from Table 2, it seems as if X6 (Dividends) is the least significant variable. This will now be removed from the model. See Table 4 below.

Table 4: (Sample 1 – Regression 2):

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.89
R Square	0.80
Adjusted R Square	0.78
Standard Error	5853.79
Observations	64.00

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	6.00	7657950634.7	127632510	37.25	0.00
Residual	57.00	1953209659.2	34266836.1		
Total	63.00	9611160293.9			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-117.64	778.50	-0.15	0.88	-1676.56	1441.28	-1676.56	1441.28
OCF (X1)	1.12	0.90	1.24	0.22	-0.69	2.92	-0.69	2.92
ROI (X2)	-25.76	7.43	-3.47	0.00	-40.64	-10.89	-40.64	-10.89
TAX (X3)	-7.45	4.97	-1.50	0.14	-17.41	2.51	-17.41	2.51
ICE (X4)	0.90	0.66	1.37	0.18	-0.42	2.23	-0.42	2.23
ECE (X5)	-2.21	0.68	-3.24	0.00	-3.57	-0.84	-3.57	-0.84
FIN (X7)	-1.08	0.93	-1.16	0.25	-2.94	0.78	-2.94	0.78

As can now be seen in Table 4, without variable X6 (Dividends), the adjusted R squared has slightly increased to 0.78 but only X2 and X5 are significant. Note also that the F statistic has risen from 31.72 to 37.25 indicating that the removal of the last variable has slightly improved the model. Continuing the backward elimination it is now necessary to remove the least significant X variable from the table. At this stage the least significant X variable as indicated by the p values is X7 (Net cash flow from financing). This will now be removed from the table and the remaining five variables will be displayed in Table 5 below.

Table 5: (Sample 1 - Regression 3)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.89
R Square	0.79
Adjusted R Square	0.77
Standard Error	5871.24
Observations	64.00

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	5.00	7611818355.86	152236367	44.16	0.00
Residual	58.00	1999341938.13	34471412.7		
Total	63.00	9611160293.99			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-124.27	780.80	-0.16	0.87	-1687.21	1438.67	-1687.21	1438.67
OCF (X1)	1.14	0.90	1.26	0.21	-0.67	2.95	-0.67	2.95
ROI (X2)	-31.33	5.69	-5.51	0.00	-42.71	-19.95	-42.71	-19.95
TAX (X3)	-7.06	4.98	-1.42	0.16	-17.02	2.91	-17.02	2.91
ICE (X4)	1.45	0.47	3.07	0.00	0.50	2.39	0.50	2.39
ECE (X5)	-1.48	0.27	-5.49	0.00	-2.02	-0.94	-2.02	-0.94

As can be seen from Table 5, the adjusted R squared has remained constant and X4 has now become significant. The p-value indicates that only X1 (changes in cash flows from operations) and X7 (net cash flow changes from financing) are insignificant at the probability level selected. The F statistic for the model has increased from 37.25 to 44.16. As X1 is the least significant, it will now be removed from the table, and a new table showing the remaining 4 variables will be shown below in Table 6.

Table 6: (Sample 1 – Regression 4)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.89
R Square	0.79
Adjusted R Square	0.77
Standard Error	5900.14
Observations	64.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4.00	7557271282	188931782	54.27	0.00
Residual	59.00	2053889011	34811678.1		
Total	63.00	9611160293			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-133.77	784.61	-0.17	0.87	-1703.76	1436.23	-1703.76	1436.23
ROI (X2)	-30.81	5.70	-5.41	0.00	-42.22	-19.41	-42.22	-19.41
TAX (X3)	-5.42	4.83	-1.12	0.27	-15.08	4.24	-15.08	4.24
ICE (X4)	1.33	0.46	2.87	0.01	0.40	2.25	0.40	2.25
ECE (X5)	-1.43	0.27	-5.34	0.00	-1.97	-0.90	-1.97	-0.90

Having undertaken the fourth step the adjusted R squared remains at 0.77 and only X3 remains insignificant as confirmed by inspecting the t-statistics and the p-values.

X3 will now be removed from the model and the final output table produced in Table 7 below:

Table 7: (Sample 1 – Regression 4)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.88
R Square	0.78
Adjusted R Square	0.77
Standard Error	5912.93
Observations	64.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3.00	7513394511	2504464837	71.63	0.00
Residual	60.00	2097765782	34962763.0		
Total	63.00	9611160293			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-71.62	784.35	-0.09	0.93	-1640.55	1497.31	-1640.55	1497.31
ROI (X2)	-29.16	5.52	-5.29	0.00	-40.19	-18.12	-40.19	-18.12
ICE (X4)	1.29	0.46	2.79	0.01	0.37	2.22	0.37	2.22
ECE (X5)	-1.29	0.24	-5.44	0.00	-1.76	-0.82	-1.76	-0.82

Note that the adjusted R-squared remains constant at 78 but the F statistic has increased quite significantly to 71.63 from 54.27 in the previous table.

The coefficient column now shows the values to apply to the X variables in order to estimate the value of Y including a value for the intercept. The value of the intercept is negative meaning that if all X coefficients were zero, the total market capitalization of the company or the market as a whole would be expected to fall independently.

Note also that in accordance with the hypothesized signs derived from the model in Chapter 8, the remaining significant independent variables have signs as hypothesized in the model, except

variable X4 where the hypothesized sign was for a negative coefficient and the result arrived at in this analysis was a positive.

Calculating elasticity estimates for the remaining X variables

Although the absolute value of the coefficient of X2 is considerably higher than the other X variables it is not possible to state categorically that X2 has the most important influence on Y. As the values in the above tables are indices it is necessary to estimate the elasticity of each variable in order to rank their respective and proportionate impacts on Y. The reason for this is that each variable coefficient has a proportionally different magnitude in comparison with Y. The elasticity estimation adjusts for these relative orders of magnitude.

In order to estimate the elasticity of the three remaining X variables, the following formula will be used measuring the elasticity of y with respect to x:

$$\eta_{yx} = dy/dx \times X/Y$$

This can be restated as follows:

$$\eta_{yx} = b_x \times X/Y$$

Therefore the relative elasticity of the three significant X variables can be calculated by calculating the mean value of the individual X variable data and dividing each by the mean value of Y and then multiplying the result by the coefficient of each X variable.
The output is as follows in Table 8 below:

Table 8: Estimated elasticity of Y with respect to X

Mean X2 (ROI)	**Mean X4 (ICE)**	**Mean X5 (ECE)**	**Mean Y (MCAP)**
-20.74	-743.97	1084.74	-1828.48
Coefficient X2 (ROI)	**Coefficient X4 (ICE)**	**Coefficient X5 (ECE)**	
-29.16	1.29	-1.29	
Elasticity X2 (ROI)	**Elasticity X4 (ICE)**	**Elasticity X5 (ECE)**	
-0.331%	***0.525%***	***0.765%***	

These estimated elasticities indicate that of the three significant variables, X5, being changes in net cash flows on external fixed asset investments and or disposals of investments seems to show the greatest impact on Y. Essentially this model says that on 95% of occasions, on average every one percent change in X5 accounts for over 3/4 of one percent of the total change in the market value of the company or group as a whole.

Testing Sample 2

As explained in Chapter 9, the second sample from the population of all FTSE companies was the sub-set of companies with the commonest year-end date. 35 companies of the 64 companies in the pilot sample had a year-end date of 31 December. The analysis below was undertaken to see if results obtained differed with this sub-set of companies when the financial periods being measured were exactly the same for all companies within the sample. The rationale behind this was to try and eliminate any distortion to the model and its validity potentially caused by the

effect of wider macro, economic, fiscal and general market conditions being different where some of the companies had different year-end dates.

The companies surveyed and the original cash flow data associated with them are included in Appendix 3:

Below is the output of the first regression containing all seven variables. The ANOVA is shown in Table 9 below:

Table 9: (Sample 2 – Regression 1)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.78
R Square	0.61
Adjusted R Square	0.52
Standard Error	3596.55
Observations	35.00

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	7.00	557650210.38	79664315.7	6.16	0.00
Residual	27.00	349250566.59	12935206.1		
Total	34.00	906900776.97			

	Coefficients	*Standard Error*	*T Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-535.05	678.44	-0.79	0.44	-1927.09	856.99	-1927.09	856.99
OCF (X1)	-1.69	0.74	-2.29	0.03	-3.20	-0.18	-3.20	-0.18
ROI (X2)	9.83	7.50	1.31	0.20	-5.56	25.22	-5.56	25.22
TAX (X3)	2.31	4.04	0.57	0.57	-5.98	10.59	-5.98	10.59
ICE (X4)	-0.67	0.60	-1.12	0.27	-1.90	0.56	-1.90	0.56
ECE (X5)	0.01	0.90	0.01	0.99	-1.83	1.85	-1.83	1.85
DIV (X6)	-16.33	4.87	-3.35	0.00	-26.32	-6.34	-26.32	-6.34
FIN (X7)	-0.45	1.02	-0.44	0.66	-2.55	1.64	-2.55	1.64

In this output it is noticeable that the adjusted R squared is lower at 0.52 than in the larger pilot sample showing that in this sub-set of companies the X variables are shown to be less significant in influencing Y, possibly as a result of weakening the power of the model as a result of *data splitting*. However, looking at the t-statistic and p-value for each variable, only variable X1 and

X6 are significant with X6 being the most significant statistically. Note also that the F-statistic for the model is quite low for this model at only 6.16.

Multi co-linearity

As was carried out in the first sample a multi co-linearity correlation test will be taken to determine if any multi co linearity exists between any of the independent variables within the sample.

This is shown below in Table 10 below:

Table 10: Multi-co linearity of independent variables within Sample 2

	OCF(X1)	ROI(X2)	TAX(X3)	ICE(X4)	ECE(X5)	DIV(X6)	FIN(X7)
X1	1						
X2	0.053827	1					
X3	0.418822	0.031872	1				
X4	-0.10764	0.425126	-0.0019	1			
X5	0.040926	-0.70365	-0.28726	-0.23912	1		
X6	0.071765	0.55283	-0.18178	0.646465	-0.20975	1	
X7	-0.0428	0.674043	0.266413	0.059325	-0.9622	0.12623	1

As can be seen from the above table there is no statistically significant multi co-linearity between most of the variables apart from X5 and X7 where there is almost perfect negative correlation between them. This is a reasonable finding as net cash expenditure on purchasing external fixed asset investments is highly likely to be associated with a corresponding inflow of cash from external sources of long-term finance such as from the issue of shares or debt to finance such acquisitions. Note that this is consistent with findings on co linearity from the pilot survey. Consistent with the approach taken with Sample 1, the least significant variable from Table 9 will be removed in the next step. This is X5 (ECE).

The output of the second regression will be shown in Table 11 below:

Table 11: (Sample 2 – Regression 2)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.78
R Square	0.61
Adjusted R Square	0.53
Standard Error	3531.76
Observations	35.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6.00	55764786	0.9292941	310.15	7.45	0.00
Residual	28.00	34925291	6.0512473	318.43		
Total	34.00	90690077	6.97			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-532.73	644.43	-0.83	0.42	-1852.78	787.32	-1852.78	787.32
OCF (X1)	-1.69	0.72	-2.35	0.03	-3.16	-0.21	-3.16	-0.21
ROI (X2)	9.83	7.36	1.34	0.19	-5.24	24.91	-5.24	24.91
TAX (X3)	2.30	3.96	0.58	0.57	-5.81	10.41	-5.81	10.41
ICE (X4)	-0.68	0.47	-1.45	0.16	-1.64	0.28	-1.64	0.28
DIV (X6)	-16.32	4.73	-3.45	0.00	-26.02	-6.63	-26.02	-6.63
FIN (X7)	-0.47	0.32	-1.45	0.16	-1.12	0.19	-1.12	0.19

In the above output the adjusted R squared has slightly improved. The F statistic is still very low but has improved. Both X1 (changes in cash flow from operating activities) and X6 (changes in cash dividends) are still significant but X3 is highly insignificant and should be removed from the model next.

The output for the remaining variables will be shown in Table 12 below:

Table 12: (Sample 2 – Regression 3)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.78
R Square	0.61
Adjusted R Square	0.54
Standard Error	3491.21
Observations	35.00

ANOVA

	df	SS	MS	F	Significance F
Regression	5.00	553432326.25	110686465.25	9.08	0.00
Residual	29.00	353468450.72	12188567.27		
Total	34.00	906900776.97			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-534.51	637.02	-0.84	0.41	-1837.36	768.35	-1837.36	768.35
OCF (X1)	-1.46	0.59	-2.46	0.02	-2.67	-0.25	-2.67	-0.25
TAX (X2)	8.88	7.09	1.25	0.22	-5.62	23.39	-5.62	23.39
ICE (X4)	-0.58	0.43	-1.34	0.19	-1.47	0.30	-1.47	0.30
DIV (X6)	-17.16	4.46	-3.85	0.00	-26.28	-8.05	-26.28	-8.05
FIN (X7)	-0.39	0.29	-1.34	0.19	-0.98	0.20	-0.98	0.20

In this output table significance F increases, as does multiple R squared to 0.54. Variables X1 and X6 remain highly significant within the 5% limit. All the remaining variables remain insignificant. The next step is to remove X2 as the least significant variable from the table. The next ANOVA will be shown below in Table 13.

Table 13: (Sample 2 – Regression 4)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.77
R Square	0.59
Adjusted R Square	0.53
Standard Error	3524.12
Observations	35.00

ANOVA

	df	SS	MS	F	Significance F
Regression	4.00	534318143.24	133579535.8 1	10.76	0.00
Residual	30.00	372582633.74	12419421.12		
Total	34.00	906900776.97			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-560.62	642.68	-0.87	0.39	-1873.14	751.91	-1873.14	751.91
OCF (X1)	-1.36	0.59	-2.30	0.03	-2.58	-0.15	-2.58	-0.15
ICE (X4)	-0.47	0.43	-1.10	0.28	-1.34	0.41	-1.34	0.41
DIV (X6)	-14.70	4.04	-3.64	0.00	-22.94	-6.46	-22.94	-6.46
FIN (X7)	-0.12	0.20	-0.61	0.55	-0.52	0.28	-0.52	0.28

In this table the adjusted R squared has fallen slightly to 0.53, so the overall statistical fit of the multiple regression has slightly deteriorated, but the F statistic has again increased to 10.78. The most insignificant variable is X7 (Cash flow changes from financing). This will now be removed from the model and the next table produced in Table 14 below

Table 14: (Sample 2 – Regression 5)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.76
R Square	0.58
Adjusted R Square	0.54
Standard Error	3488.29
Observations	35.00

ANOVA

	df	SS	MS	F	Significance F
Regression	3.00	529687987.06	176562662.3	14.51	0.00
Residual	31.00	377212789.91	12168154.51		
Total	34.00	906900776.97			

	Coefficients	Standard Error	T Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-505.29	629.79	-0.80	0.43	-1789.76	779.18	-1789.76	779.18
OCF (X1)	-1.34	0.59	-2.29	0.03	-2.54	-0.15	-2.54	-0.15
ICE (X4)	-0.46	0.42	-1.08	0.29	-1.32	0.41	-1.32	0.41
DIV (X6)	-15.01	3.96	-3.79	0.00	-23.09	-6.92	-23.09	-6.92

The ANOVA table now shows still that X1 and X6 are significant in statistical terms within this sample. However, after the removal of X7, X4 (Cash changes in internal fixed asset

investments/disposals) still remains insignificant so it will now be removed from the model leaving only the two remaining significant independent variables.

The final output is shown in Table 15 below:

Table 15: (Sample 2 –Regression 6)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.75
R Square	0.57
Adjusted R Square	0.54
Standard Error	3497.58
Observations	35.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2.00	515442572.29	257721286.1	21.07	0.00
Residual	32.00	391458204.68	12233068.90		
Total	34.00	906900776.97			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-317.77	607.09	-0.52	0.60	-1554.36	918.83	-1554.36	918.83
OCF (X1)	-1.21	0.58	-2.11	0.04	-2.39	-0.04	-2.39	-0.04
DIV (X6)	-17.84	2.99	-5.97	0.00	-23.92	-11.75	-23.92	-11.75

In the final table, both variables X1 and X6 remain significant at the 5% threshold. Note also that the intercept is still negative but shows a much larger negative than in the main survey indicating that if the coefficients of the X variables were all zero there would have been an independent downward movement in the total market capitalization of this group of companies and the FTSE index as a whole. This figure gave a much larger negative because all the companies within this sample had a year-end date of December 31st, where the pilot sample had a mix of December and earlier year-end dates, the FTSE index had therefore fallen much further with respect to this sample than the pilot.

To find out which independent variable exerts the proportionally greater influence over Y, an estimated elasticity of the values of X1 and X6 needs to be calculated as was carried out for the remaining significant variables in Sample 1.

This is shown in Table 16 below:

Table 16: Estimated elasticity of Y with respect to X

Mean X1 (OCF)	**Mean X6 (DIV)**	**Mean Y**
-5.69	-46.25	514.17
Coefficient X1 (OCF)	**Coefficient X6 (DIV)**	
-1.21	-17.84	
Elasticity X1 (OCF)	**Elasticity X6 (DIV)**	
0.013%	***1.605%***	

These estimated elasticities indicate that of the remaining two significant variables, X6 being cash changes in dividends has the proportionally greater impact on Y. Essentially this model says that on 95% of occasions, on average every one percent change in dividends paid accounts for over 1.6% of the total change in the market value of the company or group as a whole.

This result does not support the hypothesis that X6 (dividends) should not have a significant determining effect on Y as demonstrated by Modigliani and Miller, who concluded that dividends should in theory have no relevance in corporate valuation, although this hypothesis was supported

in the original sample when X6 was the least significant of all seven variables after the first regression and was the first variable to be removed from the model.

Testing Sample 3

As explained earlier, the second sample from the population of all FTSE companies was a sub-set of 35 companies from the first sample of 64 companies of the FTSE 100, all with the year-end date of 31 December. In the Pilot Study and in sub-Sample 2, analysis was carried out on cash flow statements comparing the years ending December 31 2000 and 2001. In order to observe any longitudinal differences in results it was decided to use the same sample as far as possible and undertake a multiple regression analysis to observe cash flow changes for the preceding financial periods – ending 31 December 1999 and 31 December 2000. This was done to measure whether there was any significant difference in the results obtained for different time periods with essentially the same sample and comparing for all companies for the same two consecutive calendar years, when individual company specific circumstances were different and where a different set of systematic macro economic and stock market conditions may have prevailed.

This third sample excludes three companies for which there was no cash flow data available in the FAME database for the previous period. *These were Corus, HSBC Holdings and Schroders.*

The remaining 32 companies and the comparative cash flow data within Sample 3 are shown in Appendix 4:

Below in Table 16 is the first multiple regression output ANOVA results for these 32 companies with all seven variables included:

Table 16: (Sample 3 – Regression 1)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.84
R Square	0.70
Adjusted R Square	0.62
Standard Error	3876.65
Observations	32.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7.00	861049119.93123007017.1		8.18	0.00
Residual	24.00	360682263.5815028427.65			
Total	31.00	1221731383.52			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	673.56	800.40	0.84	0.41	-978.39	2325.51	-978.39	2325.51
OCF (X1)	0.87	0.93	0.94	0.36	-1.05	2.79	-1.05	2.79
ROI (X2)	-22.77	7.75	-2.94	0.01	-38.76	-6.78	-38.76	-6.78
TAX (X3)	2.46	2.06	1.19	0.24	-1.80	6.72	-1.80	6.72
ICE (X4)	-1.82	1.56	-1.16	0.26	-5.04	1.41	-5.04	1.41
ECE (X5)	0.98	0.75	1.32	0.20	-0.56	2.52	-0.56	2.52
DIV (X6)	0.77	8.35	0.09	0.93	-16.45	18.00	-16.46	18.00
FIN (X7)	1.03	0.85	1.21	0.24	-0.72	2.77	-0.72	2.77

From the above ANOVA the adjusted R square is quite high at 0.62 but with a low F statistic of 8.18. The only significant variable is X2 (Returns on investments and servicing of finance). The least significant is X6 (dividends) again after being the least significant variable in the pilot sample but the most significant variable in the test on Sample 2.

Multi co-linearity

As with the other two samples a test of multi co linearity will be undertaken to see if there is a problem with multi-co-linearity in this sample. The results of the correlation are shown below in Table 17.

Table 17: Multi-co-linearity of independent variables within Sample 3

	OCF(X1)	ROI(X2)	TAX(X3)	ICE(X4)	ECE(X5)	DIV(X6)	FIN(X7)
X1	1						
X2	-0.47786	1					
X3	-0.66817	0.079271	1				
X4	-0.20809	0.316439	0.40865	1			
X5	-0.18257	0.525382	-0.01166	-0.17593	1		
X6	-0.76093	0.29384	0.585255	0.182068	0.11576	1	
X7	-0.06816	-0.53023	0.111081	-0.0534	-0.88127	0.074143	1

Again, consistent with findings in the previous samples the main significant multi co-linearity exists between variables X5 and X7 although some negative correlation exists between X1 (OCF) and both X3 (TAX) and X6 (DIV). Again this might not be totally unexpected, as higher cash in flows from operations would normally be associated with higher tax payments and bigger dividend distributions.

Continuing the backward elimination X6 will now be removed and a new ANOVA produced in Table 18 below:

Table 18: (Sample 3 – Regression 2)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.84
R Square	0.70
Adjusted R Square	0.63
Standard Error	3799.00
Observations	32.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6.00	860921757.65	143486959.61	9.94	0.00
Residual	25.00	360809625.87	14432385.03		
Total	31.00	1221731383.52			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	687.51	770.18	0.89	0.38	-898.71	2273.73	-898.71	2273.73
OCF (X1)	0.83	0.82	1.02	0.32	-0.85	2.52	-0.85	2.52
ROI (X2)	-22.82	7.57	-3.01	0.01	-38.41	-7.23	-38.41	-7.23
TAX (X3)	2.48	2.01	1.23	0.23	-1.67	6.62	-1.67	6.62
ICE (X4)	-1.81	1.53	-1.18	0.25	-4.97	1.34	-4.97	1.34
ECE (X5)	0.98	0.73	1.35	0.19	-0.52	2.49	-0.52	2.49
FIN (X7)	1.03	0.83	1.24	0.23	-0.68	2.73	-0.68	2.73

Having taken the second step, only variable X2 is significant of the remaining six variables. The least significant is X1 and will now be removed.

The statistical significance of remaining five variables is now shown after carrying out the third step of the backward-elimination multiple regression.

The next ANOVA is shown below in Table 19:

Table 19: (Sample 3 – Regression 3)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.83
R Square	0.69
Adjusted R Square	0.63
Standard Error	3801.36
Observations	32.00

ANOVA

	df	SS	MS	F	Significance F
Regression	5.00	846023040.16	169204608.03	11.71	0.00
Residual	26.00	375708343.36	14450320.90		
Total	31.00	1221731383.52			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	794.92	763.37	1.04	0.31	-774.20	2364.05	-774.20	2364.05
ROI (X2)	-28.10	5.50	-5.11	0.00	-39.42	-16.79	-39.42	-16.79
TAX (X3)	1.06	1.45	0.73	0.47	-1.92	4.04	-1.92	4.04
ICE (X4)	-1.80	1.53	-1.18	0.25	-4.95	1.34	-4.95	1.34
ECE (X5)	0.61	0.63	0.97	0.34	-0.69	1.92	-0.69	1.92
FIN (X7)	0.50	0.65	0.77	0.45	-0.83	1.82	-0.83	1.82

After the third step of the regression the significance of all apart from X2 of the remaining variables is still poor and adjusted R squared has not improved, although the F statistic is now at 11.71. Marginally X3 is the least significant variable and will now be removed.

The fourth step of the regression will now be taken, and the resulting ANOVA shown in Table 20 below:

Table 20 – (Sample 3 – Regression 4)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.83
R Square	0.69
Adjusted R Square	0.64
Standard Error	3768.19
Observations	32.00

ANOVA

	df	SS	MS	F	Significance F
Regression	4.00	838350694.46	209587673.62	14.76	0.00
Residual	27.00	383380689.05	14199284.78		
Total	31.00	1221731383.52			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	811.77	756.36	1.07	0.29	-740.15	2363.69	-740.15	2363.69
ROI (X2)	-28.84	5.36	-5.38	0.00	-39.85	-17.83	-39.85	-17.83
ICE (X4)	-1.15	1.23	-0.93	0.36	-3.66	1.37	-3.66	1.37
ECE (X5)	0.85	0.54	1.56	0.13	-0.27	1.96	-0.27	1.96
FIN (X7)	0.73	0.55	1.33	0.20	-0.40	1.87	-0.40	1.87

Again very little improvement is observed. The F statistic is now at 14.76, but the adjusted R squared has again remained static. Apart from X2 the remaining variables are still insignificant within the probability parameters set.

The least significant of the four remaining variables is now X4 (Fixed asset investment). This will now be removed as the next step. The next ANOVA table is shown in Table 21 below.

Table 21: (Sample 3 – Final Regression)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.82
R Square	0.68
Adjusted R Square	0.64
Standard Error	3759.62
Observations	32.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3.00	825959202.12	275319734.04	19.48	0.00
Residual	28.00	395772181.39	14134720.76		
Total	31.00	1221731383.52			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	967.69	736.04	1.31	0.20	-540.02	2475.39	-540.02	2475.39
ROI (X2)	-31.19	4.73	-6.60	0.00	-40.87	-21.51	-40.87	-21.51
ICE (X5)	1.13	0.45	2.52	0.02	0.21	2.05	0.21	2.05
FIN (X7)	0.95	0.50	1.91	0.07	-0.07	1.98	-0.07	1.98

After this latest step and removing X4, the significance of the other two variables has risen sharply with X7 only just insignificant. It might be possible to eliminate this in one final step, but as it is almost at the 95% significance level, the variable will instead be retained.

Finally the elasticities of these three variables will now be estimated as was carried out with the two previous samples.

So the final ANOVA table shows that X2, X5, and X7 have the most significant influence over Y in statistical terms, but to find out which variable exerts the most £ for £ influence over Y an estimated elasticity of the values of X2, X5 and X7 need to be calculated.
This is now shown in Table 22 below:

Table 22: Estimated elasticity of Y with respect to X

Mean X2 (ROI)	**Mean X5 (ECE)**	**Mean X7 (FIN)**	**Mean Y**
-57.9453	-807.087	278.0315	2128.015
Coefficient X2 (ROI)	**Coefficient X5 (ECE)**	**Coefficient X7 (FIN)**	
-31.1905	1.1299	0.9529	
Elasticity X2 (ROI)	**Elasticity X5 (ECE)**	**Elasticity X7 (FIN)**	
0.8493%	***0.4285%***	***0.1245%***	

These estimated elasticities indicates that X2 (net cash changes in returns on investment and servicing of finance) has the largest significant influence over Y (SVA) where for every one percent mean change in X2, the mean of Y would be expected to change by 0.84%.

Overall findings

Having tested three samples, one pilot sample and two sub-sets of this pilot, some quite significant overall results were obtained. The strongest statistical results were found in the first sample of sixty-four FTSE companies with varying year-ends, and covering overlapping financial periods. In this sample the first regression achieved a 0.77 adjusted R squared which is statistically quite significant with an F statistic of almost 32.

The results from the other two samples produced less significant results but in all samples the overall null hypothesis was rejected, in that some statistical relationship was shown to exist between at least some of the independent X variables and the dependent variable Y.

Interestingly, the intercepts of the pilot sample and sample 2, broadly covering the period from 2000 to 2001, were both negative, indicating that if the coefficients of X were zero, the market value of the mean of companies would have fallen anyway. This is feasible as in this period stock market prices started to fall significantly as a result of a major correction. However testing sample 3 (the end of the "bull market" from 1999 to 2000), the intercept was positive suggesting that market values in this case stock market values of shares were rising independently of individual company cash flow performance.

Finally to summarize the results, Table 23 shows which variables demonstrated the most overall statistical relationship with Y over the three samples. This was achieved by ranking the variables

in order of their survivability within the process of backward elimination for each of the three samples studied.

The scoring system used was to award points for ranking where one point (1^{st}) was awarded if the variable survived all stages in the backward elimination and was proportionally the most significant variable in relation to Y in the final step and seven points (last) was awarded for the first X variable eliminated in each sample. Table 23 below ranks all variables in terms of the total points they scored in the three sample tests. The variable with the lowest points total is therefore the most significant in influencing the market capitalization of companies within the survey.

Table 23: Ranking of variables for survivability in the three stepwise backward elimination regressions

X Variables	Points scored in Sample 1	Points scored in Sample 2	Points scored in Sample 3	TOTAL POINTS SCORED
X1 (OCF)	5	2	6	*13*
X2 (ROI)	3	5	1	*9*
X3 (TAX)	4	6	5	*15*
X4 (ICE)	2	3	4	*9*
X5 (ECE)	1	7	2	*10*
X6 (DIV)	7	1	7	*15*
X7 (FIN)	6	4	3	*13*

What clearly emerges from the ranking exercise is that no one X variable emerges as dominant overall and three different variables were ranked first in each sample.

Interestingly however, X6 (dividends) was lowest ranked in two of the three samples supporting Modigliani and Miller's theory concerning the irrelevance of dividends for company valuation. X6 and X3 (Taxation) were both equally lowest ranked with 15 points each. Overall the two equally ranked and most influential X variables were X2 (cash returns on investments and servicing of finance) and X4 (cash investment on internal fixed asset investment) with nine points each. However it is not possible to establish clearly at this point if any of the cash value drivers exerts more influence over market values than any others, although the research does indicate that generally these variables do have some overall statistical relationship with Y, upholding the alternate hypothesis. This was particularly the case with Sample 1. All seven variables apart from X3 (Taxation) survive as statistically significant in the final equations arrived at, in at least one of the three samples tested. The coefficients of the surviving X variables in each of the three models are shown below:

Pilot Sample (2000 – 2001): $Y = -71.62 - 29.16X2 + 1.29X4 - 1.29X5$

Sample 2 (2000 – 2001): $Y = -317.77 - 1.21X1 - 17.84X6$

Sample 3 (1999 – 2000) $Y = 967.69 - 31.19X2 + 1.13X5 + 0.95X7$

Note that the intercept is negative for the first two samples indicating that a bear market existed where value was being destroyed in the stock market through funds being moved out of equities and into bonds and other safer cash or property based investments. The intercept in the prior periods i.e. from January 1 1999 to December 31st 2000 showed a positive intercept indicating that stock markets were rising independently of individual company performances. There was a negative correlation between changes in company market capitalization and X2 being the return on investment and servicing of finance in both the pilot sample and sample 3. This might indicate that in the "bull" market 1999-2000 (sample 3) for example, companies were increasing their

long-term finance commitments and consequently increasing their net cash expenditure on servicing this finance (X7).

It is also interesting to note that whereas the effects of internal and external fixed asset investment were assumed to be negative in the testable model, the results show in the bear market X4 has a positive relationship with market capitalization but X5 has a negative relationship. However, in the final sample coinciding with the end of the bull market the X5 coefficient was positive, possibly contradicting the findings of Sirower (1996) and Agrawal, Jaffe and Mandelker (1992), who argued that acquiring companies tended to destroy shareholder value by overpaying for acquisitions.

Limitations of the study and opportunities for further research

The research was limited mainly by the overall size of the sample used. Clearly, the larger the sample and the more data that could have been collected the more reliable might have been the results. The data collection was to some extent restricted by the shortcomings of the FAME database and by the fact that the overall population studied was deliberately restricted to 100 companies. The amount of data collected was also constrained by the fact that companies only started preparing cash flow statements in accordance with FRS 1 (Revised) from 1997 onwards. The other limitation was the use of variable X7 (Financing). This variable could have been sub-divided into two variables – one for equity financing and the other for debt financing. It is possible that each could have a different and separate statistical significance with and influence over Y. Finally there was a potential problem with multi co-linearity within the model as some X variables were observed to co-vary significantly. For example X5 (cash expenditure on the acquisition of external fixed asset investments) is highly correlated to X7 (Financing), as acquisitions need to be financed from long-term funds.

Another major limitation of the research was to use of sub-sets of samples from the original pilot sample of 64 companies. This form of sampling is known as *data splitting* and it is recognized in the research that a loss of power from this method is often exhibited. It was significant that the strength of the model deteriorated with samples 2 and 3 as a result of this.

A real theoretical limitation of the approach taken in this study was to assume that changes in constituent cash flow drivers should in theory influence overall changes in company market capitalization. This would be true if an assumption of a static perpetuity without growth model (within the 5-year forecast period) was made, i.e. that no growth within a forecast period would be expected. This was not the assumption under the Rappaport (1986) approach but is assumed in the model derived and tested in this study as based on linear information dynamics.

However, economic theory would indicate that it is *unexpected* changes which should drive or destroy value as was explained from Hicks' theory of windfall gains and losses in Chapter 4. If companies or managers produced cash flow forecasts and estimates (*ex ante*) upon which analysts were to base their valuations, variances between these estimates and the actual cash flows observed could well be used to make predictions about future changes in market values, if the actual information was available early enough.

In further research it is suggested that a much larger sample of companies is taken over a much greater number of periods. It may be possible to use cash flow information derived from balance sheet information before 1997 and to research many more periods than was attempted in this pilot study. It is also suggested that per share figures are used to avoid problems with heteroscedasticity and that separate variables are identified for equity and debt financing respectively. It might also be worth carrying out a comparative study using stratified samples of companies of different sizes (dependent say on turnover or market capitalization) to observe any

significant statistical differences within the overall population studied, or to test stratified samples where one sample includes companies which have grown organically against those which have grown by merger or acquisition to see whether different cash flow drivers are more significant in these different samples.

Conclusions

This study was limited in scope and only intended to mark the beginning of a much larger scale research project into the possible relationship between the identified cash flow drivers and corporate value. Whilst this research frame was narrow in scope, it did give some encouragement to those wishing to research in this area. Even with small samples of between 32 and 64 companies, significant results were obtained particularly from the largest sample tested.

There seems to be some justification for rejecting the null hypothesis generally and concluding that there exists a statistically significant overall relationship between some of the selected independent X variables and the dependent Y variable for the samples tested. However, from two of the three samples tested it would appear that the null hypothesis relating to dividends should be accepted as it was the least significant cash flow driver in both these cases and ranked equal lowest in significance terms of all seven variables. However, whilst it is recognized that overall there seems to be some statistical relationship between changes in the selected cash flow drivers and changes in the market capitalization of the largest quoted companies, this research concludes that as yet it is difficult to identify with any statistical probability which of the variables selected has the most influence individually.

In the final chapter overall conclusions resulting from this piece of research are discussed and some recommendations put forward.

CHAPTER 11: CONCLUSIONS AND RECOMMENDATIONS

Overview of the thesis

This thesis was undertaken initially with the main objective of understanding the nature, origin, and measurement of accounting goodwill. In the first three chapters this involved a survey of the historical accounting literature to understand how accounting academics defined it, explained its origins, and attempted to deal with it in financial reporting terms.

Essentially the literature seems to be divided into two schools of thought. One school saw goodwill as representing hidden assets, and the other saw goodwill as representing excess earnings (which can be linked with the idea of abnormal or clean surplus earnings). From Chapter 4, it was explained how the above distinction in economic terms does not really exist. Fisher (1930) and Lindahl (1939) saw a circular relationship existing between assets (capital) and earnings (income). Income was created from assets or capital as economists call it, and the value of capital was at the same time determined by the level of income generated from that capital. From this was concluded that goodwill is simply a 'sink' representing the inability of the accounting model to account for value in the same way as the economic model. Essentially goodwill arose out of the generally accepted accounting principles of predominantly measuring only tangible assets, identifying assets separately, valuing assets at cost or modified historic cost and only recognizing assets under the realization principle.

All these principles (not included within the economic model) have created the goodwill issue for accountants. This problem could be ignored whilst a company grew organically as inherent goodwill was never accounted for, but the problem arises when a business is sold or purchased at its market value. It is at this point that accountants have the problem (in recent years) of having to

account for significant differences between the net book value of assets acquired and the price paid for them. Accounting standard setting bodies and academics have in the past debated how the goodwill recognized on acquisition should be accounted for. For some years the UK accounting profession had arguably made an error of principle by allowing companies to write-off goodwill against reserves when SSAP 22 (ASC, 1984) was extant, but eventually decided on the appropriate treatment by adopting FRS 10 (ASB, 1998. Internationally the latest position (at the time of writing) is for purchased goodwill to be capitalized and assessed systematically for impairment under the recommendations of IFRS 3 (IASB, 2004).

As acquisition and merger activity 'merger mania' took place in the 1980s and 1990s, the goodwill problem inevitably became ever more acute. There became an ever increasing gap between market values, based (in theory) on economic principles, and the book values placed by companies on their net assets based upon generally accepted accounting principles. Academics and other professionals began to question the reliability and particularly the relevance of financial reports for decision-making with some theorists attempting to put forward alternative accounting models in order to bridge the goodwill gap.

In Chapter 5 hybrid accounting models were discussed. These included 'clean surplus' models originating with Alfred Marshall's 'economic profit' through to the well utilized concept of 'residual income', and eventually to EVA. These models attempted to accommodate economic concepts into the accounting model. This was based on building in an opportunity cost for the risk of investing in companies by long-term investors and through recognizing expectations of future income rather than accounting for realized income, to value companies. However, whilst these models reduce the goodwill gap, they cannot eliminate it, as they still adhere to other accounting principles such as accruals and modified historic cost.

In Chapter 6 the thesis went on to show a comparative breakdown of the market capitalization of a group of companies as between the traditional accounting approach with various elements of tangible, intangibles, purchased and inherent goodwill, and the breakdown of market value within alternative models such as EVA.

This comparative analysis recognized that elements of goodwill within a company represented expectations about the future earnings capability of a company and the impact of acquisition on those earnings expectations, and the question of internal and external value synergies. Finally the chapter introduced some recommendations for financial reporting.

In Chapter 7 the closer relationship between pure free cash flows and overall market value was discussed introducing the shareholder value added model of Alfred Rappaport (1998). An illustrative example was used to explain that Rappaport's model built in value from expectations of free cash flows for a five-year forecast period. This model was adapted to use a cost of equity rather than the weighted average cost of capital as an alternative yet equivalent method of arriving at the same valuation. The Rappaport model identified seven cash value drivers to be used as the basis for the empirical research. These cash flow constituents in effect provide another way (as examined in Chapter 6) of decomposing the market value of a company or group.

In Chapter 8 a valuation approach based on the Edwards, Bell, Ohlson (EBO) model was used to formalize the Rappaport model into a testable model. This model, unlike those of recent researchers in this area, moved away from the split between book values and clean surplus earnings, to being a pure cash valuation model in a more holistic sense. This model was extended along the lines of Feltham and Ohlson (1995), but then simplified to ignore the accruals based constituents, irrelevant within a cash flow based model.

In Chapter 9 the thesis moved forward to a discussion and rationale for a methodology for testing the model using a multiple linear (backward elimination) stepwise regression to identify whether collectively or individually any of the independent cash flow variables selected from the derived model had any significant relationship or impact over the dependent variable Y, being the overall change in the market value of a quoted company between the beginning and end of a given financial period.

In Chapter 10 the results of the three sample tests undertaken were presented and discussed. It was found that particularly in the first sample selected there was a strong statistical relationship between the independent variables and the dependent variable, although the nature of this differed in the other comparative samples studied. It was also concluded that no one independent variable seemed to have any more statistical significance or influence over the dependent variable than any other. It was recommended that due to several limitations of the study undertaken, particularly in terms of size and scope, that a much larger and more comprehensive survey should be undertaken probably extending beyond the FTSE 100 companies to the whole population of quoted companies and not necessarily restricted to UK companies.

Conclusions

To conclude, this thesis has explored the origins and nature of goodwill and identified it as a peculiarly accounting issue arising from long-held accounting conventions that are in conflict with economic theory. As a consequence, goodwill merely represents an accounting measure of the inability of conventional financial reporting to account holistically for the value of companies (whether or not it was ever intended to do so).

It is only when companies engage in predatory acquisition activities, as has become the fashion in the last twenty years of the twentieth century that goodwill became such an acute issue for the accounting profession.

The results of the empirical research contained within this thesis would seem to indicate from a normative perspective at least (in accordance with economic and financial management theory) that cash flow information should be significant in assessing the intrinsic value of a company, determining whether to invest in a company or not. This thesis has concluded that cash flow information does have some relevance in that a statistical relationship between movements in constituent cash flows and valuation has been observed. From an empirical perspective therefore, it may be possible to at least assess, if not predict, how value has been created or destroyed in terms of observing key changes in cash flow drivers of value such as those identified in the model used in this investigation.

Recommendations

At least from a normative, if not from a positive empirical perspective, this thesis has explained that cash flow information and market valuation should be and probably are inextricably linked. The fact that accounting based values and market values never coincide and a permanent goodwill gap exists is an inevitable consequence of the accounting approach and does not invalidate the choices of those making the markets. The values of shares are always based on the interaction of demand and supply and are the culmination of a large number of past transactions or events.

The accountancy profession has in recent years moved forward in the refinements of some of its valuation metrics, with many of the latest accounting standards and the statement of principles being based more closely on the balance sheet paradigm rather than upon the "transactions approach". This reform may not have moved far enough however and the accounting model, because of its need to be objective and verifiable, rather than necessarily relevant and valid, is therefore still in some ways an inadequate source of information for decision-makers.

From the literature review within this thesis it would seem that certain accounting based adjustments should be made to the book values of companies to bring them more in line with their economic or market value and to make them more relevant. These include the following:

Using some form of formal inflation or value accounting system for recognizing and measuring assets, rather than adopting the ad hoc modified historic cost system where the current inconsistencies between the revaluation policies of different companies make it difficult for investors to make valid comparisons and where in those companies not following a formal revaluation system, many of their assets are understated. The inflation accounting system to be adopted should be decided by the accounting profession and based on drawing a proper balance between relevance, reliability, and practicality. Whether Edwards and Bell's (1964) entry value, exit value, or mixed system is to be adopted is a question of sensible choice and has already been debated at length during the 1970's and 1980's, only to be abandoned and ignored in the UK since then. At least by adopting an internationally acceptable and practical inflation accounting system and referring back to the comparative breakdown of value discussed in Chapter 6, investors could be reasonably confident that accounting goodwill wouldn't comprise the systematic under valuation of individual tangible and intangible assets.

Another component of goodwill that could be eliminated is the under recognition of separable intangibles. Stewart (1991) identifies and describes several adjustments that come under this classification, such as capitalising research and development expenditure and certain types of operating leases.

The accounting standard setters may need to examine whether other kinds of expenditure such as particular types of advertising, promotion, or staff costs could be capitalised along the same grounds as justified for capitalising applied development expenditure or borrowing costs currently. One key area here would be to re-examine the whole issue of brand accounting and whether under strict guidelines, the capitalisation of such brands (a valuable asset for many companies) should not be permitted.

Another area which academics and researchers have identified as a source of value is in the recognition of human assets and the possibility of capitalising investment expenditure on staff such as training, development, "golden hellos" and even 'golden goodbyes'

From an accounting perspective, having ensured (as far as possible) that separate tangible and intangible assets are reliably recognised and measured, any remaining value gap between book value and market values will ultimately consist of purchased and inherent goodwill, represented by internal and external synergies and 'hidden assets'.

The purchased goodwill in any company represents goodwill recognised on the acquisition of another entity. From an accounting perspective it has now been agreed universally that this should be capitalised and amortised. However, the ASB in FRS 10 (ASB, 1998) and the IASB in IFRS 3 (IASB, 2004) tacitly allow the non-depreciation of purchased goodwill and have thereby blurred the distinction between purchased and inherent goodwill in companies which grow by acquisition and have arguably increased inconsistency with the recognition and measurement of

goodwill as between companies which grow organically as compared with those which grow through acquisition.

It is recommended in this thesis, in keeping with the latest recommendations made by the IASB in IFRS 3 (IASB, 2004) and indeed those of Leake, (1921) that for pragmatic reasons, purchased goodwill should be assessed for impairment by reference to the market capitalisation of the company as a whole and left un-depreciated if no impairment is recognised. (See below).

Inevitably as shown in the breakdown in Chapter 6, one part of the goodwill gap will comprise Chambers' (1966) and Canning's (1978) internal synergies, or the (2+2) = 5 effect. This surplus value is based on the use of assets in concert rather than individually. Clearly no separate account can be taken of this under an accounting model, as Lee (1971) and Paton (1924) suggest and this element of market value could never be separately identified as part of the total goodwill of a company.

From Chapter 6 it was also made clear that a major element of inherent goodwill in a quoted company, where mergers and acquisitions are common is represented by the anticipation of take-over either within the "predator" company or the "prey". If the value of shares in the potential acquiring company rises on anticipation of the take-over, this indicates that external synergies are expected and that shareholders in the acquiring company will become better off after the transaction has taken place. However as Rappaport (1998), Sirower (1996), and Agrawal Jaffe, and Mandelker (1992) suggest in their research, more often than not, it is the value of the shares in the potentially acquired companies that tend to rise on anticipation of a take-over, demonstrating that acquiring companies often pay too large a price on acquisition and fall into the 'synergy trap'. However, the findings from the survey contained within this thesis suggest that cash expenditure on external fixed or long-term asset investments creates rather than destroys corporate value.

It is recommended that although neither of these internal or external synergies may be recognised or measured individually, the overall value of a company's goodwill can be legitimately benchmarked against the company's quoted market value. This is based on the argument that the value of shares (at least at the margin) is a product of the forces of supply and demand, and formed as a consequence of a whole series of verifiable past market transactions and events. For this reason it is recommended that financial reports could now contain a *market capitalisation reserve* (MCR) under shareholders funds and showing the countervailing inherent goodwill on the intangibles section of the balance sheet. The size and periodic changes in the inherent goodwill/MCR would be a reference point or a benchmark that investors could legitimately compare companies with. Only when the MCR becomes negative should the purchased goodwill and in extreme situations, intangible and tangible assets, start to be eliminated from the balance sheet. These values could then be re-instated in the event of the market values exceeding these book values at some future date. Companies with growing MCRs are likely to be those with high growth expectations. Companies with falling or negative MCRs would be seen as either having fulfilled or realised their expectations or to have under achieved against expectations. Under the ASB's 'all inclusive' approach, adjustments to the MCR, as with all other unrealised gains and losses, should be disclosed within the statement of total recognised gains and losses (STRGL) or within the statement of changes in equity under international GAAP.

In order for investors and analysts to assess the overall value of the company, its share price, and how these are anticipated to change over time, it is also necessary for cash flow statements to contain cash flow estimates or forecasts for the coming period or periods. As analysts and investors increasingly use cash flow information for valuation and decision-making purposes, more emphasis needs to be placed by accountants on clearer and more detailed reporting of cash flow movements as expected from one period to another. For valuation purposes, according to

economic theory, it is expectations of cash flows and the differences between these estimates and the actual cash flows, which is of most relevance to investors in making valuation assessments.

If companies published budgeted cash flow statements and the actual cash flow statements with variances against those forecasts, it would be possible for investors to gauge to what extent companies were under or over achieving against expectations, and it would be possible to assess potential 'windfall' gains and losses as a result of expectations being over or under achieved.

External financial reporting and its adherence to generally accepted concepts and principles, where reliability seems to be given more prominence than relevance, could provide more useful information if some of the recommendations above were adopted. This would help to provide investors and their representatives with a better source of information from which to make informed assessments of corporate performance and position and also to offer a better guide to decision-making.

Finally however, it must be accepted that as currently produced, external financial reports are inevitably "servants" in some respects to these long-held fundamental concepts underpinning them. For this reason, under the currently accepted accounting paradigm, it may be impossible for balance sheets ever to fully represent statements of value, for all the reasons given and explored in this study.

APPENDIX 1:

PILOT SURVEY - 64 FTSE Companies - Mixed year ends (2000 - 2001)

Company name:	OCF (X1)	ROI (X2)	TAX (X3)	ICE (X4)	ECE (X5)	DIVS (X6)	FIN (X7)	MCAP (Y)
Allied Domecq	51	6	-54	-107	-418	-163	556	926
Amersham	130	8	-32	184	1	-4	-125	716
Amvescap	-31	-21	-51	-11	-76	-21	218	-2640
Arm	15	1	-7	-4	2	0	1	-1410
Astrazenica	-187	95	-116	-117	-526	-41	-398	-5095
BAE Systems	-1123	-112	-35	-76	1625	-64	618	-2148
BAA	81	1	-13	-312	-11	-28	-61	2483
BAT	521	-48	-260	-109	-430	-58	1647	1720
BG	-1956	254	162	344	-79	229	1313	586
BHP Billiton	2523	-224	-299	-1697	-1070	-354	752	15566
Boots	-90	-13	-13	-184	-30	-8	-244	19603
BP	1845	-318	927	-2087	-1798	-386	1617	-945
British Airways	65	-38	17	-311	244	48	-202	776
British Land	-47	-44	-326	347	695	35	-976	297
BSkyB	194	-51	7	-59	258	0	-689	-10560
Cable and Wireless	-888	294	-53	-2423	1593	-58	-1284	-15466
Cadbury Schweppes	193	-40	-14	-153	325	-11	-250	-337
Capita Group	21	-4	-11	-12	22	-3	-13	-41
Centrica	-238	4	38	-172	-17	-12	845	-1375
CMG	-39	-7	24	-2	239	-4	-211	-3932
Corus	72	5	30	161	308	31	409	219
Diageo	233	-8	55	76	-592	-42	868	6406
Dixons	-90	-9	-35	12	161	16	-224	-208
Electrocomponents	20	-5	5	-8	242	-7	-173	-400
EMI Group	68	-44	52	-62	144	33	-393	-1829
Gallaher	294	6	-31	-39	-905	-5	609	3082
Granada	-391	23	30	-47	1993	-59	223	1166
Gus	-488	-6	-14	-61	-43	1	217	1107
Hanson	118	-15	-13	-6	1540	-10	-1009	105
Hays	-8	-15	-7	-30	100	-8	-13	-3163
Hilton	-16	25	-7	643	-685	-9	36	233
HSBC Holdings	-1219	-338	70	-5716	5157	-962	-3171	-15244
Invensys	-745	-43	-75	228	-1207	62	1716	-2665
Kingfisher	262	1	-5	799	531	-1	-1042	-1706
Land Securities	33	18	-13	93	-114	3	213	614
Lloyds TSB	2453	-81	35	-7849	4843	-216	-691	2139
Man Group	98	5	6	-3	-63	-4	-276	798
Marks and Spencer	35	-3	-19	-91	27	155	-265	340
Next	13	-2	1	24	66	-1	308	650
Northern Rock	238	-18	4	-259	0	-7	67	-19728
Pearson	129	-23	19	106	1836	-31	-2293	-6399
Prudential	-347	16	-182	0	128	-33	1047	-5503
Reckitt Benckiser	101	24	10	-5	-137	-2	71	593
Rentokil Initial	-1	-25	25	10	-376	17	610	543
Reuters	35	0	-14	203	57	-22	212	-6443
Rio Tinto	-40	151	-122	-498	1649	-37	-967	2048
Rolls Royce	-61	24	1	74	132	-10	471	-455
Royal Bank of Scot	-4041	-353	-482	-4355	1267	-266	-195	5965
Safeway	16	-3	-45	107	24	42	-207	1825
Sainsbury	84	-15	50	-81	890	20	-776	2452
Schroders	880	36	60	-923	-493	0	151	-1342
Scottish and Southe	-183	-22	3	221	-221	-13	193	846
Scottish Power	294	-116	1	-239	-236	-63	317	-761
Severn Trent	-54	-33	43	210	-2883	93	82	425
Shire Pharmaceutica	150	8	-41	17	29	0	-26	1443
Smith and Nephew	12	-10	-30	-6	154	434	-141	968
Standard Chartered	1692	-62	-161	-4304	1180	-53	-230	-1590
Tesco	424	-30	-59	-739	-75	8	632	6974
Unilever	385	-614	-271	-171	19498	-40	-17672	-885
United Utilities	-42	2	36	63	216	200	14	-270
Vodafone	2077	476	-1260	-18255	35409	552	-10558	-88605
WM Morrison	4	1	-19	56	1	-5	-1	665
Wolseley	128	-13	22	8	-226	-10	63	818
WPP Group	-449	15	3	-18	-449	-18	294	-977
Mean:	**50.19**	**-20.74**	**-38.33**	**-743.97**	**1084.74**	**-18.26**	**-443.55**	**-1828.49**

KEY:
OCF (X1) = Change in Operating Cash flow
ROI (X2) = Change in Cash returns on investments and servicing of finance
TAX (X3) = Change in cash flow for taxation
ICE (X4) = Change in Cash flow on acquiring or disposing of fixed assets
ECE (X5) = Change in Cash flow used or generated on acquiring or disposing of investments in other companies
DIV (X6) = Change in Cash flow used in paying dividends
FIN (X7)= Change in Cash flow raised from and/or paid back to long term investors
MCAP (Y) = Change in market capitalisation of the company from the beginning to the end of the year

APPENDIX 2:

Table of t-statistics

F-statistics with other P-values: P=0.05 | P=0.01 | P=0.001
Chi-square statistics

df	P = 0.05	P = 0.01	P = 0.001
1	12.71	63.66	636.61
2	4.30	9.92	31.60
3	3.18	5.84	12.92
4	2.78	4.60	8.61
5	2.57	4.03	6.87
6	2.45	3.71	5.96
7	2.36	3.50	5.41
8	2.31	3.36	5.04
9	2.26	3.25	4.78
10	2.23	3.17	4.59
11	2.20	3.11	4.44
12	2.18	3.05	4.32
13	2.16	3.01	4.22
14	2.14	2.98	4.14
15	2.13	2.95	4.07
16	2.12	2.92	4.02
17	2.11	2.90	3.97
18	2.10	2.88	3.92
19	2.09	2.86	3.88
20	2.09	2.85	3.85
21	2.08	2.83	3.82
22	2.07	2.82	3.79
23	2.07	2.81	3.77
24	2.06	2.80	3.75
25	2.06	2.79	3.73
26	2.06	2.78	3.71
27	2.05	2.77	3.69
28	2.05	2.76	3.67
29	2.05	2.76	3.66
30	2.04	2.75	3.65

31	2.04	2.74	3.63
32	2.04	2.74	3.62
33	2.03	2.73	3.61
34	2.03	2.73	3.60
35	2.03	2.72	3.59
36	2.03	2.72	3.58
37	2.03	2.72	3.57
38	2.02	2.71	3.57
39	2.02	2.71	3.56
40	2.02	2.70	3.55
41	2.02	2.70	3.54
42	2.02	2.70	3.54
43	2.02	2.70	3.53
44	2.02	2.69	3.53
45	2.01	2.69	3.52
46	2.01	2.69	3.52
47	2.01	2.68	3.51
48	2.01	2.68	3.51
49	2.01	2.68	3.50
50	2.01	2.68	3.50
51	2.01	2.68	3.49
52	2.01	2.67	3.49
53	2.01	2.67	3.48
54	2.00	2.67	3.48
55	2.00	2.67	3.48
56	2.00	2.67	3.47
57	2.00	2.66	3.47
58	2.00	2.66	3.47
59	2.00	2.66	3.46
60	2.00	2.66	3.46
61	2.00	2.66	3.46
62	2.00	2.66	3.46
63	2.00	2.66	3.45
64	2.00	2.65	3.45
65	2.00	2.65	3.45

66	2.00	2.65	3.44
67	2.00	2.65	3.44
68	2.00	2.65	3.44
69	2.00	2.65	3.44
70	1.99	2.65	3.44
71	1.99	2.65	3.43
72	1.99	2.65	3.43
73	1.99	2.64	3.43
74	1.99	2.64	3.43
75	1.99	2.64	3.43
76	1.99	2.64	3.42
77	1.99	2.64	3.42
78	1.99	2.64	3.42
79	1.99	2.64	3.42
80	1.99	2.64	3.42
81	1.99	2.64	3.42
82	1.99	2.64	3.41
83	1.99	2.64	3.41
84	1.99	2.64	3.41
85	1.99	2.63	3.41
86	1.99	2.63	3.41
87	1.99	2.63	3.41
88	1.99	2.63	3.41
89	1.99	2.63	3.40
90	1.99	2.63	3.40
91	1.99	2.63	3.40
92	1.99	2.63	3.40
93	1.99	2.63	3.40
94	1.99	2.63	3.40
95	1.99	2.63	3.40
96	1.99	2.63	3.40
97	1.98	2.63	3.39
98	1.98	2.63	3.39
99	1.98	2.63	3.39
100	1.98	2.63	3.39

APPENDIX 3

SAMPLE 2 - 35 FTSE 100 Companies (Year end 31st December) - 31st December 2000 to 31st December 2001

COMPANY NAME	OCF X1	ROI X2	TAX X3	ICE X4	ECE X5	DIVS X6	FIN X7	MCAP Y
Amersham	129.60	8.20	-31.80	184.00	1.00	-3.50	-125.00	716.00
Amvescap	-31.10	-20.63	-51.27	-10.92	-76.12	-20.81	217.70	-2640.00
Arm	15.11	0.83	-6.72	-4.26	1.55	0.00	0.76	-1409.00
Astrazenica	-187.00	95.00	-116.00	-117.00	-526.00	-41.00	-398.00	-5096.00
BAE Systems	-1123.00	-112.00	-35.00	-76.00	1625.00	-64.00	618.00	1690.00
BAT	521.00	-48.00	-260.00	-109.00	-430.00	-58.00	1647.00	1720.00
BG	-1956.00	254.00	162.00	344.00	-79.00	229.00	1313.00	586.00
BP	1845.00	-318.00	927.00	-2087.00	-1798.00	-386.00	1617.00	-945.00
Cadbury Schweppes	193.00	-40.00	-14.00	-153.00	325.00	-11.00	-250.00	-337.00
Capita Group	21.11	-4.37	-11.43	-12.10	21.64	-3.01	-13.13	-41.00
Centrica	-238.00	4.00	38.00	-172.00	-17.00	-12.00	845.00	-1375.00
CMG	-39.40	-7.40	23.80	-2.40	238.80	-4.20	-211.20	-3931.00
Corus	72.00	5.00	30.00	161.00	308.00	31.00	409.00	219.00
Gallaher	294.10	5.50	-30.70	-38.90	-904.50	-4.90	609.40	425.00
Hanson	117.90	-15.20	-12.70	-6.40	1540.40	-9.60	-1008.80	106.00
Hilton	-16.30	25.20	-7.00	643.20	-684.50	-8.90	36.30	233.00
HSBC Holdings	-1219.00	-338.00	70.00	-5716.00	5157.00	-962.00	-3171.00	26186.00
Kingfisher	262.00	1.00	-5.00	799.00	531.00	-1.00	-1042.00	-1706.00
Lloyds TSB	2453.00	-81.00	35.00	-7849.00	4843.00	-216.00	-691.00	2139.00
Northern Rock	238.00	-18.00	4.00	-259.00	0.00	-7.00	67.00	397.00
Pearson	129.00	-23.00	19.00	106.00	1836.00	-31.00	-2293.00	6400.00
Prudential	-347.00	16.00	-182.00	0.00	128.00	-33.00	1047.00	-5503.00
Reckitt Benckiser	101.00	24.00	10.00	-5.00	-137.00	-2.00	71.00	593.00
Rentokil Initial	-1.40	-25.00	24.80	10.40	-376.30	16.80	609.70	544.00
Reuters	35.00	0.00	-14.00	203.00	57.00	-22.00	212.00	-6443.00
Rio Tinto	-40.00	151.00	-122.00	-498.00	1649.00	-37.00	-967.00	2055.00
Rolls Royce	-61.00	24.00	1.00	74.00	132.00	-10.00	471.00	-455.00
Royal Bank of Scot	-4041.00	-353.00	-482.00	-4355.00	1267.00	-266.00	-195.00	5965.00
Schroders	880.00	36.00	59.90	-923.00	-493.00	-0.10	151.00	-1342.00
Shire Pharmeuc	149.95	7.84	-40.59	16.92	28.70	0.00	-25.55	1444.00
Smith and Neph	12.10	-9.50	-29.70	-5.90	153.70	433.90	-140.90	968.00
Standard Chartered	1692.00	-62.00	-161.00	-4304.00	1180.00	-53.00	-230.00	-1590.00
Unilever	385.00	-614.00	-271.00	-171.00	19498.00	-40.00	-17672.00	-876.00
WM Morrison	4.27	0.99	-19.10	56.01	1.46	-4.52	-0.72	276.00
WPP Group	-449.00	15.00	3.00	-18.00	-449.00	-18.00	294.00	-977.00
Mean	**-5.69**	**-40.44**	**-14.16**	**-694.15**	**987.22**	**-46.25**	**-519.96**	**514.17**

KEY:

OCF (X1) = Change in Operating Cash flow
ROI (X2) = Change in Cash returns on investments and servicing of finance
TAX (X3) = Change in cash flow for taxation
ICE (X4) = Change in Cash flow on acquiring or disposing of fixed assets
ECE (X5) = Change in Cash flow used or generated on acquiring or disposing of investments in other companies
DIV (X6) = Change in Cash flow used in paying dividends
FIN (X7)= Change in Cash flow raised from and/or paid back to long term investors
MCAP (Y) = Change in market capitalisation of the company from the beginning to the end of the year

APPENDIX 4

SAMPLE 3 - 32 FTSE 100 Companies (Year end 31st December) - 31st December 1999 to 31st December 2000

COMPANY NAME	OCF X1	ROI X2	TAX X3	CAP EXP X4	A+D X5	DIVS X6	FIN X7	MCAP Y
Amersham	75.50	14.90	5.00	-58.40	-263.70	-3.90	195.80	1017.00
Amvescap	214.92	3.55	-59.30	-23.86	-235.23	-9.16	-29.51	5507.00
Arm	20.68	1.48	1.71	-12.81	-1.71	0.00	2.03	-2855.00
Astrazenica	881.00	-7.00	195.00	728.00	-722.00	-68.00	-155.00	13950.00
BAE Systems	1475.00	-47.00	22.00	-151.00	-157.00	-102.00	-1809.00	3130.00
BAT	673.00	-294.00	-264.00	-65.00	304.00	-50.00	-2463.00	3546.00
BG	963.00	154.00	37.00	-312.00	1171.00	16.00	-2031.00	-4650.00
BP	7366.00	-3.00	-3384.00	-1430.00	430.00	-417.00	-2291.00	-354.00
Cadbury Schweppes	193.00	-40.00	-14.00	-153.00	325.00	-11.00	-250.00	95.93
Capita Group	21.10	-4.37	-11.43	-12.10	21.64	-3.01	-13.13	-41.00
Centrica	-255.00	-33.00	16.00	-22.00	572.00	467.00	-407.00	3175.00
CMG	24.98	-8.56	-6.72	-4.67	-212.25	-4.64	230.18	-442.00
Gallaher	-930.00	-17.60	-25.10	-7.90	-256.50	-5.30	1283.70	913.00
Hanson	150.80	-62.60	10.80	-71.50	-940.60	-7.30	682.10	34.00
Hilton	98.80	43.30	9.60	-340.90	336.90	53.10	-133.90	208.00
Kingfisher	165.70	-47.70	-31.80	-208.00	271.40	7.80	-59.40	92.00
Lloyds TSB	6213.00	-208.00	-57.00	2316.00	-5003.00	-237.00	-1170.00	-3532.00
Northern Rock	512.00	-12.00	-5.00	-403.00	0.00	-4.00	-102.00	140.00
Pearson	-72.00	-15.00	66.00	-782.00	-1615.00	-11.00	2590.00	435.00
Prudential	356.00	-37.00	76.00	0.00	2012.00	-40.00	-766.00	-2414.00
Reckitt Benckiser	94.20	-1.50	-16.80	-23.30	83.60	3.30	7.60	2202.00
Rentokil Initial	-106.30	-22.50	-8.40	32.10	369.20	-0.60	-668.30	4819.54
Reuters	31.00	-8.00	8.00	-96.00	-119.00	2.00	696.00	4106.00
Rio Tinto	1477.00	132.00	-65.00	-278.00	-1934.00	-81.00	-2280.00	-4265.00
Rolls Royce	120.00	-37.00	13.00	-54.00	613.00	14.00	-982.00	-172.00
Royal Bank of Scot	6269.00	-799.00	-416.00	-2567.00	-2936.00	-248.00	3647.00	30494.00
Shire Pharmeuc	13.06	-5.07	-0.69	-9.21	-0.36	0.00	23.43	1218.00
Smith and Neph	5.90	-10.40	13.60	-1.60	87.80	22.40	178.40	548.00
Standard Chartered	1642.00	-41.00	29.00	426.00	-848.00	-102.00	431.00	648.00
Unilever	544.00	-421.00	-147.00	317.00	-17100.00	7.00	14604.00	7632.00
WM Morrison	57.24	3.02	8.78	-61.42	-1.46	-3.47	0.99	750.00
WPP Group	274.50	-24.20	-22.60	-118.50	-78.50	-4.90	-65.00	2161.00
Mean	**892.78**	**-57.95**	**-125.73**	**-107.75**	**-807.09**	**-25.65**	**278.03**	**2128.01**

KEY: *OCF (X1) = Change in Operating Cash flow*
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